

Australian Model Engineering

January-February 1999

Issue 82

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In This Issue: ☒ Build a Steam Calliope
☒ Melbourne's 4th Model Engineering Exhibition
☒ Narrow Gauge Rail Truck



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Front Cover

Wanting to build something completely different, Hugh O'Dempsey decided to have a go at this narrow gauge truck which in full size, would be converted from a road vehicle. It's seen here at home on the Berry Railway. (More details on page 12)

Photo: David Proctor

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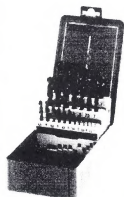
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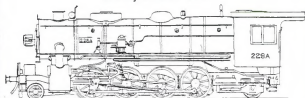
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Comment

I bet you have a story to tell

In the last two months I have had the pleasure of attending three very impressive gatherings of model engineers. The first one was the 4th Melbourne Model Engineering Exhibition, followed by the 10th National Miniature Traction Engine Rally in Canberra, and then the annual gathering of boating enthusiasts hosted by the ACT Model Boat Club, also in Canberra.

The Melbourne Model Engineering Exhibition is covered in a pictorial report beginning on page 44. The number and diversity of models on show was most inspiring as was the number of modellers whose work was on display. The Traction Engine Rally was a great success, once again with a large variety of beautifully executed models (there will be a full report in the next issue), as was the gathering of boats. There were literally dozens of boats in attendance, steam, sail and electrically driven, and the workmanship was exquisite.

Since then I have finished putting this magazine together and have just been sitting back and having a good look at it. It occurs to me that when you look at most model engineering magazines, this one included, you could be forgiven for thinking that model engineers only build railway locomotives and rolling stock, with the occasional one dabbling in workshop equipment and practices. As I have just indicated, there are all these people who build boats, traction engines, clocks, trams, road vehicles, agricultural equipment, military models, aircraft and so on — all forms of model engineering, but we do not see or hear that much about them in this type of magazine. Why?

Maybe they are just not as forthcoming when it comes to talking about their ideas and achievements as are the railway brigade, even though their models are as good as any, anywhere. Do they feel that people are not as interested? I have noticed that non-railway model engineering gatherings are generally much more social occasions than are their rail-bound counterparts. Is it because railway gatherings "bind" everyone to the track — once your loco is on the track, you are on your own, and you cannot just up and leave it. Maybe more "on location" social intercourse reduces the desire to communicate to the wider world.

Whatever the reasons, we at AME would love to hear more from all you "silent" modellers out there, and I am sure that most of our readers would like to hear your story and to see your model. How about it?

David Proctor

Join us in a great hobby!

If this is your first issue of *Australian Model Engineering*, welcome!

In successive issues we cover many topics centred on that wonderful process of model engineering — alias *tinkering*.

If you're new to model engineering as well as our magazine, you'll benefit from getting together with other model engineers — we're good at sharing ideas and saving each other money! If you don't have any contacts, start by looking in Club Roundup to find a club that's near to you. Many of our readers have discovered people with similar interests literally just around the corner.

Helping other model engineers is the simple idea of the volunteers behind this magazine. Our readers write items for us — for the same (non-existent) rate of pay! If you have ideas, opinions or techniques that you feel would be interesting to others (especially from the newcomer's angle), please drop us a line. We can send you a useful guide and help with preparing artwork or editing.

I hope you'll enjoy the great fellowship that makes our hobby special, and that you'll support our advertisers — after all, they help pay our bills!

David Proctor
Managing Editor



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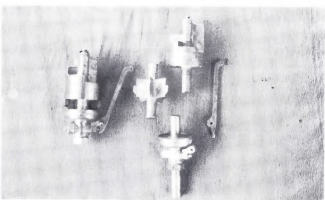


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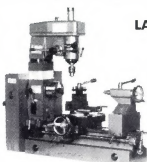


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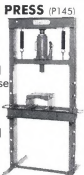
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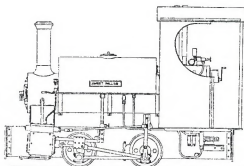
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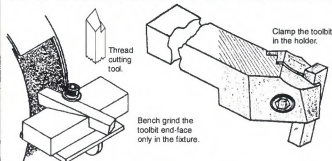
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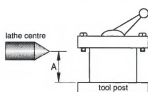
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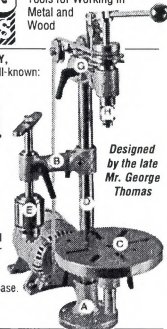
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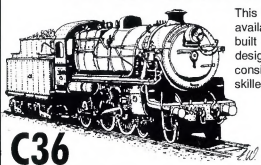
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Photos by Jon Milne Fowler. Drawing for publication by Jim Gray

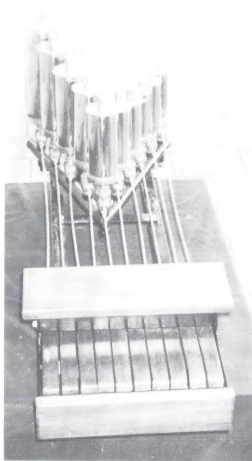
The steam calliope was invented in 1855 by Joshua Stoddard an American, when he connected a manifold of eight steam whistles to a piano keyboard. From that day in 1855 to the present, this raucous instrument became the standard music for American carnivals, circuses, steam boats and of course street parades. It is no surprise to learn that Disney has one, bought from, of all places, the U.K. This 150 note instrument is mounted on a horse drawn wagon with its boiler and operator going full blast. With 60 lbs on the gauge it is said it can be heard two blocks away. I wonder if they fit ear plugs to the horses because I bet the operator has some!

My ten-note calliope is based on one featured in the American magazine *Live Steam* of June 1977. This instrument was built by Mr Andrew Thompson and his father for their steam boat *Fire Canoe*. I have always had a keen interest in steam whistles and when I read Mr Thompson's article I made myself a promise that one day I would build one.

It was a fellow club member, Morris Cooper, who motivated me to build the calliope. Morris and I are both members of the Castledare Miniature Railway in Perth and at the time we were trying out various combinations of notes for Yankee chime whistles. Morris' daughter, Megan, who is a student of the piano was making contributions as well by playing the notes for us. Also at this time Morris and I were on the organising committee for the forthcoming A.A.L.S. Convention to be held at Castledare Railway over the '98 Easter weekend, but alas, as it turned out, this

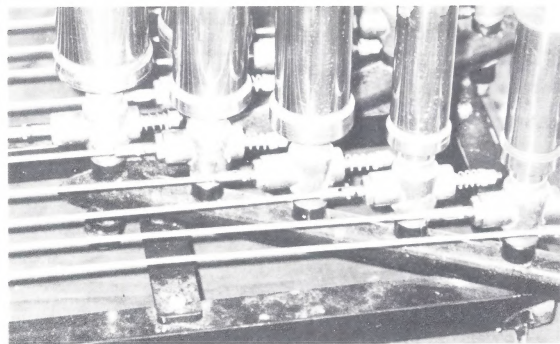
was not to be. Had the convention taken place at Castledare, on the Sunday we all would have spent the day operating our locomotives in a bi-directional manner with section staffs, name board etc. This was Morris Cooper's responsibility for he was of the opinion there should be some interesting features to our conventions rather than just running around the track 'follow the leader' style. I am sure most people would agree with this concept — I certainly did and at the time I was thinking of doing a project to celebrate 100 years of Model Engineering. Having spent 50 years in this great hobby of ours I just had to do something. The convention being the deadline, all these things gelled together and I remembered the calliope and as they say - "the rest is history".

Now for some technical information. The calliope has 10 notes which start in middle C and continue up the C scale without any sharps or flats (black keys). The instrument can play anything in the key of C within the 10 note range. My favourite is *Dixie*. The Thompson Calliope uses stainless steel tube for the whistle bells because this material comes in a comprehensive range of sizes. I decided to use copper tube for the same reason, also it was very cheap. Near where I live is a scrap yard that provided all the material for the calliope which included the copper tubes for the bells, brass rod for the control valves and square steel tube for the frame — all for under \$100.00! With polished



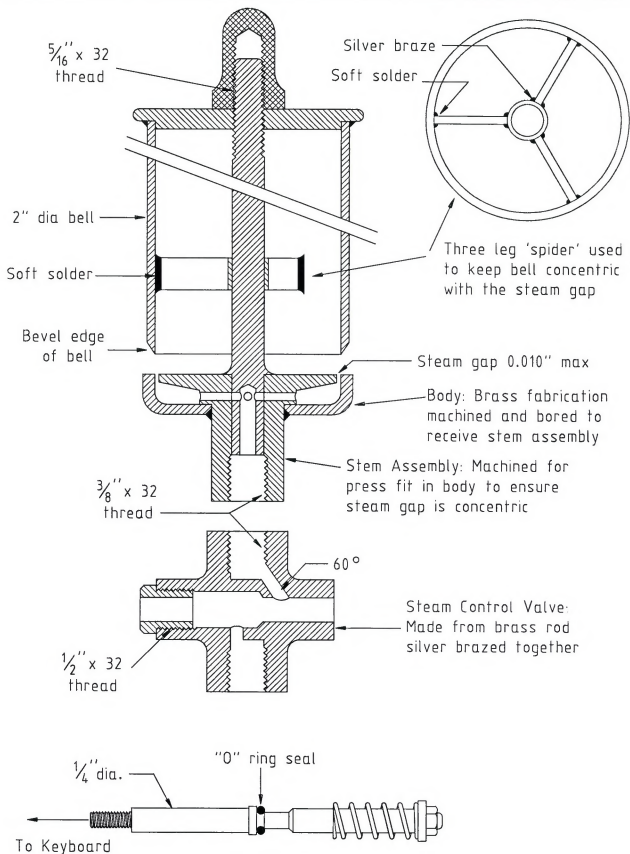
Above: The completed calliope minus stand, showing keyboard.

Below: A closer view of the valves and rods at the base of the bells.

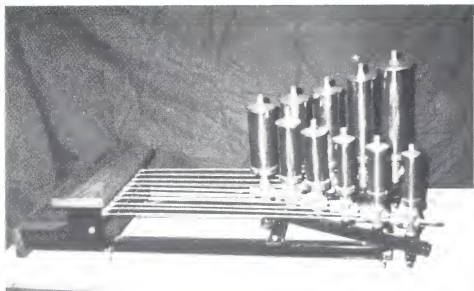


copper bells on a black frame fitted with brass fittings and completed with a polished jarrah keyboard and trim, the whole piece looks pretty good, even if I do say so myself.

I did not follow Mr Thompson's design for the bells. I preferred to use my own pet design which I have used many times over the years and which will produce a clear note (see drawing). This drawing shows the salient features which in my experience will produce a successful steam whistle, the most important being the steam gap which, even for the large bell $2\frac{1}{2}$ " diameter needs only to be 0.10" max. With only a 10 thou steam



CALLIOPE BELLS
 TYPICAL CONSTRUCTION METHOD



The completed calliope before mounting on its own stand

gap, any of the bells can be screwed down the stem to a mouth opening approximately $\frac{1}{8}$ " where, with only lung pressure a clear note can be made, even with the $2\frac{1}{2}$ " diameter bell.

The Thompson calliope featured bronze castings for the steam control valves. I decided to fabricate mine from brass rod, silver brazed together, the design being typical of a standard whistle valve but with the valve stem fitted with an 'O' ring seal instead of the usual stainless ball. Using an 'O' ring as a seal makes it possible for light springs to be fitted to the end of the valve stem, which is essential when playing the keyboard, especially when the player is a young person.

The 'V' shape frame which forms the base unit for the bells is made from 1" thick wall copper tube and was silver brazed together and hydro tested to 100 lbs per square inch. The reason for doing this was I deemed this part of the calliope to be an extension of the boiler system and should be treated as such, you can't be too careful can you?

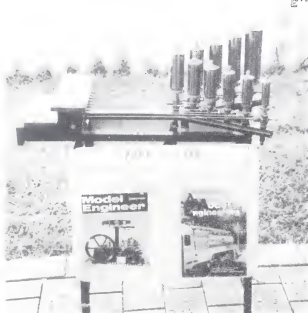
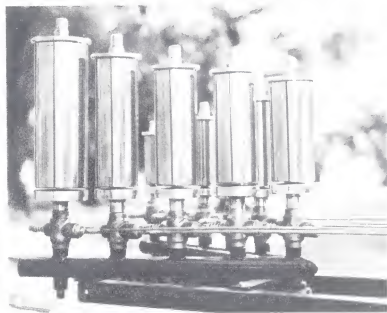
You will note on the drawing that the larger diameter bells are fitted with a three legged spider, soft soldered in about 1" from the bottom. The reason is to keep the bottom of the bell concentric with the steam gap when it is screwed up or down the stem to tune the note. A bell without the spider tends to wobble a bit off centre (well mine do!) and makes tuning a whistle to the correct note difficult — a common fault in making a steam whistle.

Using a small air compressor to generate pressure at 10 lbs per square inch and tuning the bells to suit, Morris and I took it along to the A.A.L.S. Convention which had been transferred to Forrest Park Railway, Bunbury, two hours south of Perth. On Saturday and Sunday it was made available to anyone who wanted to have a go and even John Beal of S.A.S.M.E. left his loco for a short time to give us a melody. It was certainly different and generated quite a lot of interest, so much in fact that the questions I was asked over the weekend prompted me to supply some details and write this article.



Above, below and belowleft: three views of the completed calliope

As you can imagine, the calliope is a great crowd puller and the kids just love it. There's no shortage of volunteers to step forward and have a go. Every now and then someone comes forward usually with a musical background and plays one or two melodies. When this happens it makes my day and makes the time and effort to build it all meaningful and worthwhile which is what model engineering is all about. Right?



A Narrow Gauge Rail Truck

An Unusual Model for 7 1/4" Gauge

by Hugh O'Dempsey

Photos by David Proctor unless indicated otherwise

In the beginning there was an idea. There were no plans — just a desire to build something simple which would be fun. Taught by the experience of taking forever to load and unload a van plus trailer load of standard gauge trains, and usually knocking

parked behind you and the owners nowhere to be found! If only I could lift my loco out...hmmm.

A growing interest and exposure to narrow gauge had shown a huge variety of machinery had existed, and quite often was very unusual

there was a precedent somewhere in the world.

And so the grey matter started oozing thoughts — maybe a powered work trolley...nah! Maybe a foreman's jeep...nah, too small to ride on. What about a van or small bus derivative...nah. But heck, the idea and the model is becoming bigger and bigger. And so the decision of a narrow gauge flat bed rail truck emerged and was decided on. Plenty of room to ride on, prototypical and different. I mean, without being at all disrespectful to other modellers, nearly everyone builds a 'regular' model. We needed something more unusual, beautiful as 'regular' models may well be.

Without any plans or pictures, I sat on the floor and said I need this much room, then measured how much space was needed for an engine and bonnet, plus a bit for luck. The chassis was made from 20mm x 38mm R11S. Now, don't race off to the steel shop looking for it, 'coz it ain't there! It comes as packaging framework for John Deere ride-on lawn mowers, so you'll have to rescue some from your dealer before he takes them to the tip.

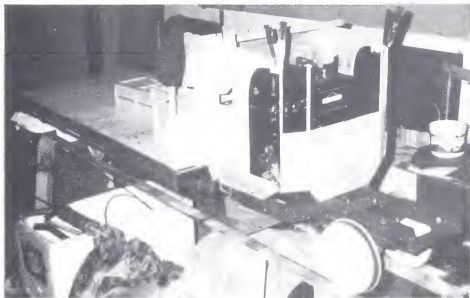
A dip and spread section was formed under the cab area of the chassis, as per a typical truck, and this was also where the 3hp Briggs & Stratton horizontal shaft motor was to go. Next, a trailing 'A' arm arrangement was made for the rear suspension, hanging the axle

Early days and the chassis is complete with motor and gear box Photo: Hugh O'Dempsey

myself up doing so, I decided that something much simpler was needed

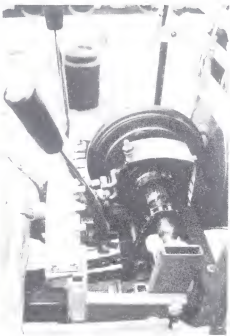
Tied to that equation was the frustration that came when you parked in a siding for a cuppa, only to come back and find two more

to boot. I mean, if they could put wheels onto it and hook it to a motor, they did! And as far as modelling is concerned, no one could say "that isn't prototype" because you can bet

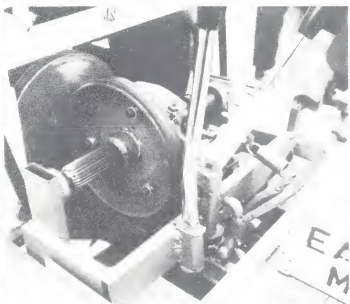


The body panelling was made from plywood, shown here being held temporarily in place, prior to fitting.

Photo: Hugh O'Dempsey



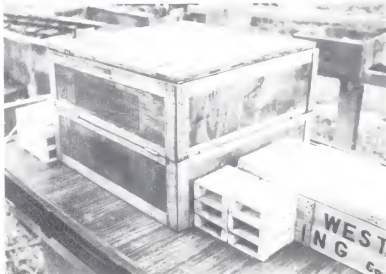
The gear box arrangement as completed with cover 'load' removed



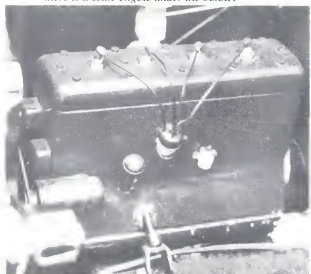
Another view of the gearbox arrangement



As well as the motor in the cab which drives the truck, there is a scale engine under the bonnet



Part of the load. The large crate folds out to be the driver's seat.



The other side of the scale motor. Note distributor and plugs.



The unfolded drivers seat in position



Views of both sides of the truck, showing the detail achieved with signage and scale tools.



The completed truck is ready for the road, or in this case, ready for the track. Note the working headlights.

via bearings and bolt-on plumber blocks. Easy! Datsun 1600 valve springs gave the bounce!

The front was going to require more thought. By this stage we were looking at a four foot wheelbase. I thought that this may give problems with flange-lock, and so had to stop for a bit as this would require more grey matter than I had! And so, for the first of many times on this project, I asked my gracious Heavenly Father "What are we going to do here, Lord". As I worked, the thoughts and answers were just given to me. The answer to this one was that I needed the front to steer, swivel and be suspended. A system was devised which I guess is similar to a 'pony truck' setup. Because it was not my idea, it works brilliantly!

The transmission is based on an Arien ride-on mower type of motor-driven disc and sliding drive wheel. The disk is fixed to the end of the crank shaft and the sliding drive wheel is at a right angle to that disc, sliding along a splendid shaft, on the end of which is a sprocket. That sprocket has a chain which eventually finds its way to the rear axle. I adapted the splines from the output shafts of a Datsun gear box.

The cab is made from 9mm construction ply. Windows are perspex, mudguards and bonnet sheet metal and the radiator fabricated from 3mm plate. The headlights are 35mm, 20 watt halogen down lights in what were originally 1½" to ¾" galvanised water pipe reducers.

The trickiest part, I felt, was to make a seat that didn't look like a seat when you walked away from it. I wanted it to appear as an authentic and typical load of the era. Again, the Lord gave me the answer and we have a

great little crate that unfolds to a seat, folding easily back into an unobtrusive crate.

The name KESED on the Radiator is an ancient Hebrew word, which literally translated means "Gods everlasting covenant love for man". With the help He gave me building this I could not give it a lesser name. The local trophy shop happily shaped, engraved and painted the badge for me.

Is the truck successful? Wonderfully so! It is simple, it is fun, it is different and it gives a lot of people pleasure to look at. And as I have found out already, when blocked in, it is simple to lift on or off the track. I hope this model encourages others to venture into the wonderful, varying and fun world of narrow gauge modelling. I have found it extremely rewarding.

Finally (below), a very happy man takes his pride and joy for a run on the Berry Railway



A Special Day on the Mackenzie Line

Story and photos by Dave Harper

I was told by several people that Sunday June 28 was to be a special running day at the Bracken Ridge Lions Club 5" gauge track in McPherson's Park, Bracken Ridge, on the

northern outskirts of Brisbane. Trouble was, no-one seemed quite sure what the event was.

However, as the track is only a few minutes from my home, I made it my business to

the place was really humming; the official opening had been carried out by QR CEO Vince O'Rourke, who left just before I arrived, and people were still queuing for rides.

I spotted a smart loco parked while it's driver had a break, but the LMS didn't look like the LMS that I remembered from the UK. It turned out to be Alan Houston's 2-6-40 American switcher (**photo 1**) from his Lindisfarne Miniature Railway, at Buderim on the Sunshine Coast!

Next came a face I knew — Kenny Saunders on his version of the switcher, without the leading bogie. This loco was acquired by Kenny in a pretty dreadful state and he has reboilered it and otherwise reworked it into a reliable workhorse, but hasn't got around to painting it yet — **photo 2** shows it in action, **photo 3** is a close-up of the Weir type feed pump complete with Sampson shuttle valve in its latest form.

Another unpainted loco, which even I recognised as a QR A10, came by, driven by a bearded gentleman that turned out to be none other than Bill Olds from Maryborough (**photo 4**), brother of Peter whom I had met some time ago. It was great to finally meet Bill, as I had written to him, spoken on the phone to him, but never met him until now!

A double-header came by, QR B12 leading an A10, both owned by Neil Mackenzie, driven by Phil Blank and Don Reid respectively.

Photo 5 shows one of my QSVMS mates, Eric Abbott, driving his British Southern Railways U Class, newly finished and running well. The only problem was when the handle broke off the hand feed pump, and he was kept waiting in the queue; Eric had to resort to



Photo 1

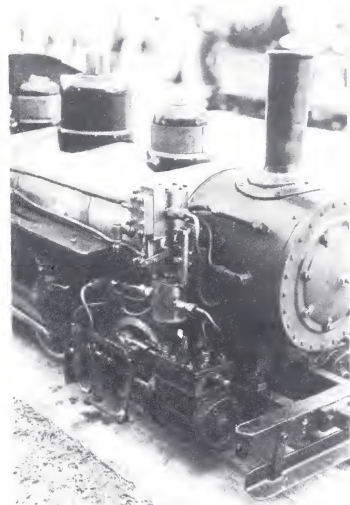


Photo 3. The angle of the chimney is an artifact of the camera angle, the same loco is shown in photo 2

front up on the allotted day, complete with camera. Thanks to much support from local businesses, the facilities at McPherson Park have kept on improving, with a storage shed, station awning, fencing, etc. all in place. When I arrived, about lunchtime,



Photo 2



Photo 4

pushing the loco backwards and forwards to pump more water into the boiler using the axle driven pump!

Ray Chapman proudly drove his QR AC16, another Mackenzie built loco. Yet another Mackenzie design is the QR BB18 1/4 of Terry Philip in photo 6, another loco that performs as well as it looks.

There were 25 locos in steam that day, but I didn't think the editor really wanted that many pictures, so these few must suffice. It all added up to another most successful day for the local Lions, with over 2000 rides given on the day, and another healthy boost to their funds.

Oh, and I finally found out what the occasion was, talking to Neil Mackenzie while he identified the photos for me. The day marked the third anniversary of the turning of the first sod for the track back in 1995! The track was completed in the remarkably short time of 5 months, the first run being on 12 December 1995 and the official opening on 23 March 1996, which I reported in these pages. The track was named the Mackenzie Line in hon-



Photo 5

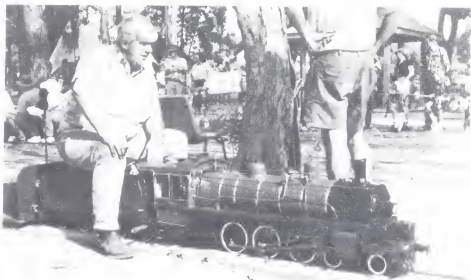


Photo 6

our of the great amount of effort put in by Neil in driving the project along, and he is still regarded as 'Boss Cocky' on running days.

along with the local Lions crew. Well done, fellers!

Southern Federation Trophy

Once again we approach nomination time for this trophy. The Trophy is awarded at the annual AALS Convention and is a "club person" type award. The rules governing the award are simply that the nominee:

- Must be a financial member of an AALS affiliated society and be present at the convention with a locomotive.
- Must be an active club member

A person may be nominated by:

- Any two members of an affiliated society.
- By any affiliated club, nomination signed by president and secretary. If one of those are the nominee then another committee person to sign.

Nominations, together with CVs will be accepted by the AALS Secretary until 5pm on the Saturday afternoon of the convention.

There are people out there who deserve to be recognised, so let us have those nominations at Newcastle at Easter.

Any queries, contact: Peter Manning on (08) 8278 8677 or Barry Glover on (02) 4284 0294

IBLS Meet of the Millennium

British Columbia Society of Model Engineers
Burnaby, B.C. Canada

12 - 13 - 14 August 2000

A tour, organised to attend this event, is on the move again. The tour dates are 10 August to 31 August 2000 ex Sydney.

As well as the IBLS Meet there is general 'mother-pleasing' sight seeing, a visit to Tom Miller's extensive layout (7 1/2' Big Boy) in Oregon, plus Train Mountain. (If you haven't seen the Train Mountain video, I suggest you get a look at it.)

The tour starts in Vancouver and finishes in San Francisco. A worst case current costing (before recent gains to the US Dollar) is approx. \$6000 on a twin-share basis. Firm prices available around July 1999

Serious expressions of interest are now required. Some people previously indicated interest but unfortunately the file with their names has been mislaid.

Please send expressions by mail to 31 Spinks Road, Corral NSW 2518 or fax to (02) 4283 2331

Barry Glover

IBLS Secretary (East Australia Region)

Lighting for your Live Steam Loco

Steve Malone

Drawings for publication by Jim Gray

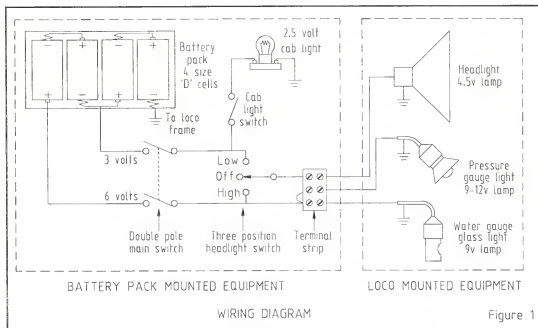


Figure 1

Operating a live steam locomotive at night can be a most enjoyable experience. The ambience of the model locomotive is increased greatly by the warmth of the fire and loco, the condensate sputtering in the exhaust and the piercing headlight lighting up the track ahead, all add to the enjoyment of the hobby. An efficient loco lighting system is most helpful for night running, and the effort of taking the time to make and install a quality system is amply repaid by the enjoyment in using it.

This article describes a battery powered system based on my experience. The ultimate of course, would be a steam driven turbo-generator system but for my 5" gauge 0-4-2T Perry tank loco (1 1/2" scale) we use four D size 1.5V batteries (normal torch batteries) mounted in a battery holder pack.

The battery pack is installed under the cab roof when required, and is quickly fixed into place by two 2BA screws. The pack is fitted with a switch panel and a terminal strip to allow connection to the loco lights, and it only takes a minute or two to

install and connect the battery pack.

An array of suitable battery holders is available from electronics supply stores, such as Dick Smith, Tandy, etc.

Figure 1 shows the circuit diagram of the lighting system used on the Perry. The headlight was fabricated from an assortment of

large brass nuts and off-cuts, silver soldered together to give the required shape, then turned in one operation to give the end product.

The four 1.5V batteries in series give an output of 6V which powers the 4.5V headlight bulb and the 2 cab fitting lights which illuminate the pressure gauge and the gauge glass. The lights to illuminate fittings in the cab are fitted with 12V lamps as used in HO scale model railways, and by using a 6V supply, these 12V lamps give a warm glow to cab fittings without being too bright (see Figure 2).

However, this was not bright enough for my water level gauge glass, so I purchased a 9V radio dial lamp and the 6V supply applied to this lamp gave the required brighter light.

A general purpose light can be fitted in the cab using a standard 2.5V torch bulb, used mainly when 'lighting up' the boiler or when stationary. This is a normal 'screw in' torch bulb and in my case, is fixed to the roof-mounted battery pack and powered by the 3V tap in the battery pack.

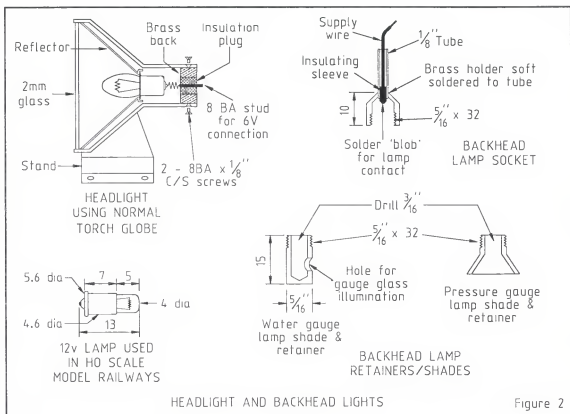


Figure 2

Figure 2 shows the assembly of the headlight and the cab fitting lights using the 12V lamps.

Figure 3 shows the cab fitting lights using the radio dial lamp bulbs. A headlight with a 6V supply gives a good light, bright enough for a large 7/4" gauge loco and a three-posi-

was suggested and this was purchased, modified and installed — so far, so good. The reflective surface on these torches is soft, so go easy during modifications. Perhaps it is best to buy two torches (around \$1 each) in case you muck one up like I did, or maybe even buy three, so as to have an extra one for

Presently I'm trying out the Krypton bulb which is certainly brighter. Never mind about the cane toads now, it's the wallabies you'll dazzle with these lamps.

Other lamp types could require a different form of installation and types of turned fittings. Figure 4 illustrates the alternatives.

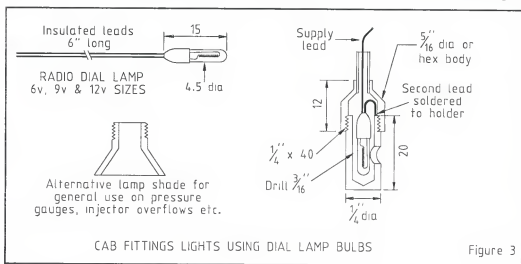


Figure 3

tion switch modifies the supply voltage to 6V, 3V, and 0V, giving bright, dim and off. (No need to dazzle the oncoming drivers or intending passengers, just dip your headlight to dim in those circumstances and save battery power.) The headlight on 6V dazzles the cane toads so they are mesmerised and you give them the big squish with your cowcatcher or pilot.

The position of the headlamp on your loco will determine how hot your lamp fitting will get, and care also needs to be taken in selecting the internal headlight materials, particularly the reflector.

My first reflector lasted many years, being a cheap K-Mart torch reflector machined to suit. It became deformed recently and I replaced it with another K-Mart cheap torch reflector, which lasted only one run before it became deformed. Perhaps the new materials are more sensitive to heat.

Asking around in the club for ideas for a better replacement, a cheap 'Beamer' brand torch from Target (which has a metal reflector),

a spare in the future.

There are four types of suitable torch bulbs available these days — the cheap K-Mart types, the Eveready heavy duty types, the Eveready 'Krypton' lamps — 60% more light with 50% more power consumed ('Krypton' sounds like something Superman once used, or was it his Boy Wonder?); and finally, quartz lamps (these are larger and even brighter, with a warning on them about melting reflectors, no steam loco required!).

Wiring can be installed in most cases with 3mm (1/8") OD brass or copper tube, best prepared by feeding the wire through first and bending later. In hot areas, one can use a single strand winding wire which has enamel and cotton coverings. The cotton outer coating can be varnished before use and would resemble the open/covered wiring used on steam locos some years ago.

For smaller locos one can use a two-battery/3V system based on standard torch bulbs, but for a more 'scale' appearance, one might opt for the tiny 3V bulb available at Tandy (Archer Part No 272-9504 — the replacement lamp for their focusing pencil torch). As you can see in Figure 4, the bulb is very small and the single strand connection wires are very frail, but recent trials with this type of bulb were very successful on a *Speedy* loco (John Eisel) and a *Janet* rail motor (Hugh Eisel).

We hope this article has given you some ideas about loco lighting and will encourage you to show the way at your Club's night run in the near future.

(Article from QSMEE "Oil Can")

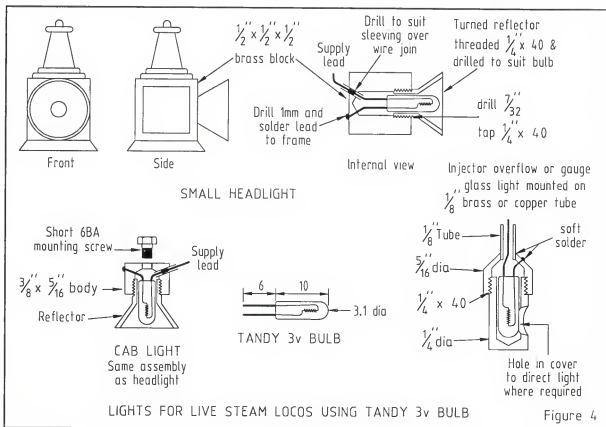


Figure 4

Two-Cylinder Single-Acting High Speed Steam Engines — part 2

by Don Payne

A simple design for a fabricated engine of $1\frac{1}{16}$ " bore x $\frac{3}{4}$ " stroke is shown in **Figure 15** with drive to the piston valve from an eccentric on the main shaft by a bell crank

edges in an upright position. Reverting to the Westinghouse standard engine, earlier in this article a miniature version of this engine is shown in **Figure 16** depicting an engine of

crank driven slide valves and are loosely based on the engine shown in **Figures 17** and **18**. These engines are quite heavy and would therefore not be suitable for a boat. The engine shown in **Photo 2** is of lighter construction and the cylinder block is built up from drawn brass tubing. A modified form of the enclosed crankcase Westinghouse Junior engine in model form is shown in **Photo 3** and is $\frac{3}{4}$ " bore x $\frac{3}{4}$ " stroke with a slide valve instead of piston valve as in the full size engine.

It is hoped this presentation will goad you into a flurry of activity to produce a worthwhile model of this very interesting and simple style of steam engine. Remember though, that in this engine the cranks are at 180 degrees and not at 90 degrees.

In my research from *Modern Engines and Power Generators* by Rankin Kennedy and dated 1904, I found the engine shown in **Figures 19** and **20** from which I was unable to deduce the brand name, but which gave the following interesting information on lubrication of these enclosed high speed engines. "The crankcase is kept half filled with oil and water which, when the engine is running, is in a few minutes churned into a foam, and while it offers little or no resistance to the moving parts, thoroughly lubricates all internal bearings constantly and by using the same oil over and over again economically. A sight feed lubricator for the steam pipe is provided and this

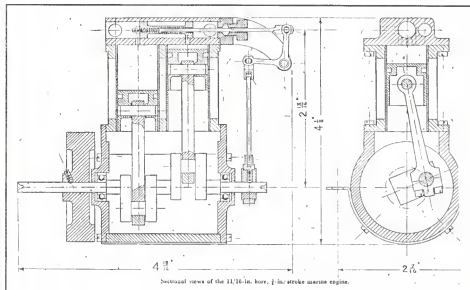


Figure 15

The cylinders were drawn brass tubes, silver soldered at each end into $\frac{1}{8}$ " brass plates, whilst the built up crankcase was made from a 2 inch length of $1\frac{1}{8}$ " tube with a chord faced off and two pieces of $\frac{1}{8}$ " x $\frac{3}{16}$ " brass, 2 inches long, silver soldered to the machined

$\frac{3}{8}$ " bore x $\frac{1}{8}$ " stroke with a central piston valve driven by an eccentric and bridle on the centre of the main shaft. This must have been very difficult to assemble.

Four engines I have built are shown in **Photo 1** and are open column type with bell

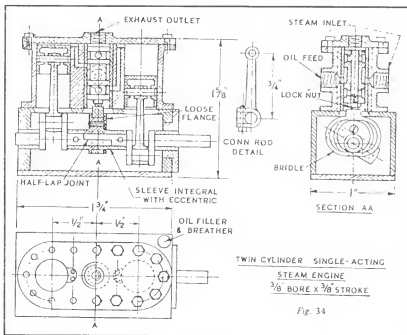


Figure 16

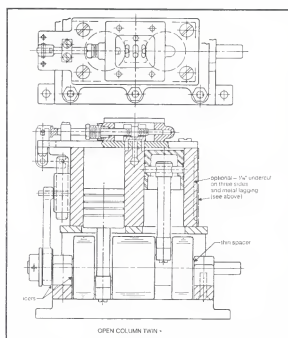


Figure 17

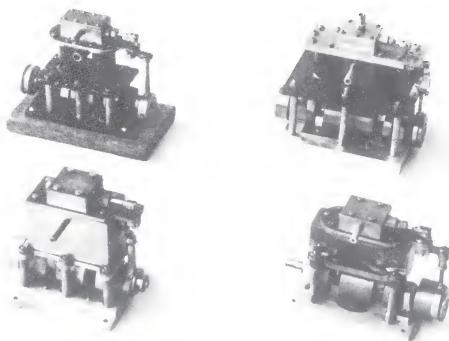


Photo 1

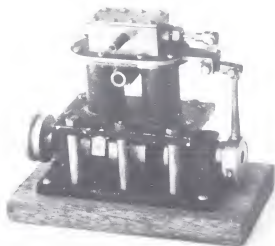


Photo 2 (above) and Photo 3 (below)

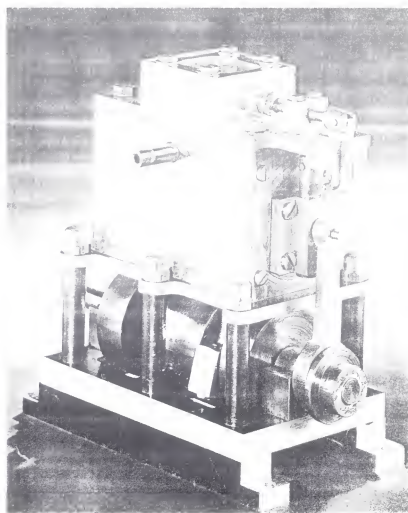
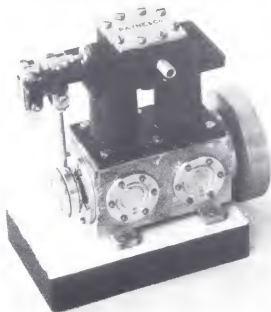


Figure 18

is the only part of the engine requiring daily attention. A little oil may at stated periods, be poured into the crankcase by the vapour pipe or oil funnel, which allows any vapour which may in the course of time escape from the bottom of the pistons, free exit to the atmosphere. The depth of oil and water in the crankcase is limited by the height of the overflow of the oil separator. This contrivance also, by allowing water only to escape, further economises oil.

The water level in the crankcase should never be allowed to fall more than 1 inch below the outlet of the separator and the best oil to use in making up the level is "Black Virginia", costing about 1 Shilling per gallon. Expensive light oils must on no account be used, as they will not mix with water."

Yet another valve variation is shown in the cross section of the Acme engine in **Figure 19**, this valve being of the semi rotary or rocking type. These engines were available in sizes from $2\frac{1}{8}" \times 3\frac{1}{2}"$ to $7" \times 7"$. Another cross section of the Westinghouse engine is shown in **Figure 20** and is taken from *Audiles Engineers and Mechanics Guide* Vol. 2 of 1921.



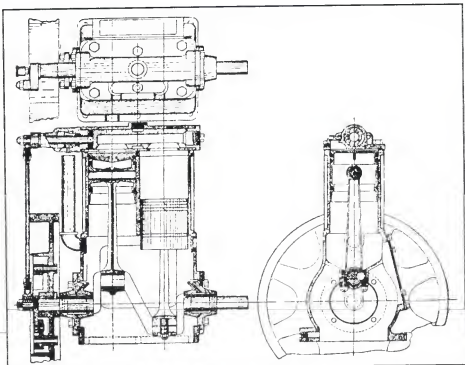


Figure 19 (above) and Figure 20 (below)

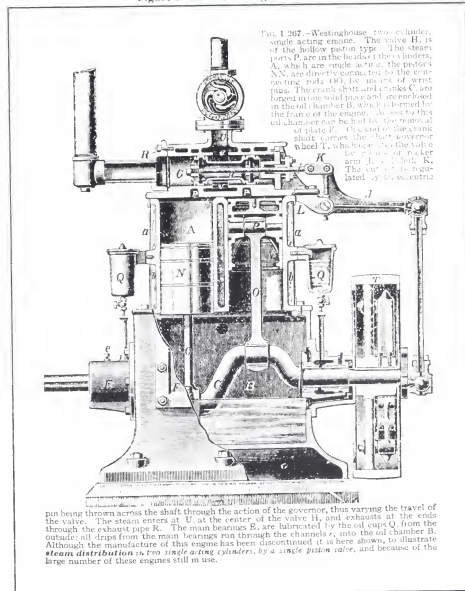


FIG. 1, 267 - Westinghouse two cylinder, single acting engine. The valve H, is of the hollow piston type. The steam ports P, are in the heads of the cylinders. A, which are single acting, the pistons N, are directly connected to the connecting rods (O), by means of wrist pins. The crank shaft and crank are engaged in the crank pin B, which is formed by the frame of the engine. A, as to the oil chamber can be held by the removal of plate P. The end of the crank shaft carries the short governor wheel (L), which uses the valve lever of the maker arm (J), to the K. The cut-off is regulated by the eccentric

pin being thrown across the shaft through the action of the governor, thus varying the travel of the valve. The steam enters at U, at the center of the valve H, and exhausts at the ends through the exhaust pipe K. The main bearings E, are lubricated by the oil cups Q, from the outside; all drops from the main bearings run through the channels, into the oil chamber B. Although the manufacture of this engine has been discontinued it is here shown, to illustrate steam distribution in two single acting cylinders, by a single piston valve, and because of the large number of these engines still in use.

Australian Model Engineering

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A Climax Back in Gippsland

(You too can build this in a 2 bedroom flat)

Story and photos by Bob Haesler

Back in 1964 a friend rang and invited me to see a steam locomotive sitting derelict at Erica in Gippsland, Victoria. This was Locomotive No. 1694 previously owned by the Forests Commission of Victoria and supplied by the Climax Manufacturing Co. in the U.S.A.

the locomotive is built in the same way as a conventional one.

The Climax sat on a disused siding by the side of the road at Erica in Gippsland until 1965, when it was loaded by the Department of Supply, for transportation to Menzies Creek Museum (operated by the Puffing Billy

ings, require no machining, and are of excellent quality. So everything could now be finalised and serious construction began.

Up until my retirement earlier this year, my job as a Piping Design Draftsman took me everywhere in Australia for various periods of time (from 3 months up to 2 years in any one spot). Wherever I could, I would set up my workshop in the second bedroom of a rented flat (hence the sub title of this article).

The equipment comprised two work benches. One has a small unimat lathe and a half inch drill press on it, the other has a four inch vise and shadow board on it.

Progress at last

With the exception of the wheels and gears, the model is fabricated from steel, brass and copper.

The main frame, end beams and stretchers are fabricated from mild steel and brass rectangular sections and brass angle. The frame stretchers are there for appearance only, the whole frame being completely rigid due to the end beams, bogie stretchers and gearbox housing.

The gearbox housing is fabricated from mild steel plate and brass angle. Each of the four sides is fitted with a bronze bush and



B Class Climax No. 1694 in steam once again, on the Puffing Billy Railway PBPS Photo

We spent several hours measuring, sketching and photographing the loco in the hope that one day we would reproduce it in miniature. Some arrangement drawings were made, but it was 30 years later that a serious start was made to build a live steam miniature. The gauge is $1\frac{3}{4}$ " (45mm) at a scale of 0.7" = 1 foot (1:17).

The prototype

The locomotive was operated by the Forest Commission of Victoria, as already mentioned, on the 2'6" gauge Tyers Valley Tramway, from 1928 up until the final closure of the tramway in 1949.

The Climax Locomotive was designed as a low speed, high torque loco, suitable for sharp curves and roughly laid tracks. It is driven by two inclined cylinders (one each side) which drive a cross shaft. This in turn drives a transverse shaft via skew bevel gears (skew bevel gears allow one drive shaft to pass above or below the other shaft). This transverse shaft runs the length of the locomotive from each side of the cross shaft gearbox. The drive is then transmitted by skew bevel gears to each axle of the two bogies.

Apart from this drive arrangement and the main frame (rolled steel channels), the rest of

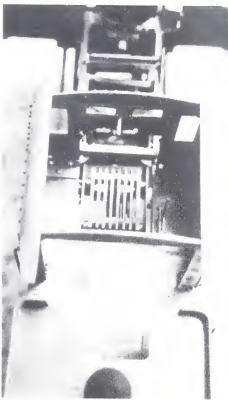
Preservation Society), where it was placed on display.

In 1982, the decision was made to restore it to running order. After countless hours work by a dedicated band of volunteers, it ran under its own steam on 18 June, 1988. It is now housed at Belgrave, Victoria and does regular passenger hauling runs.

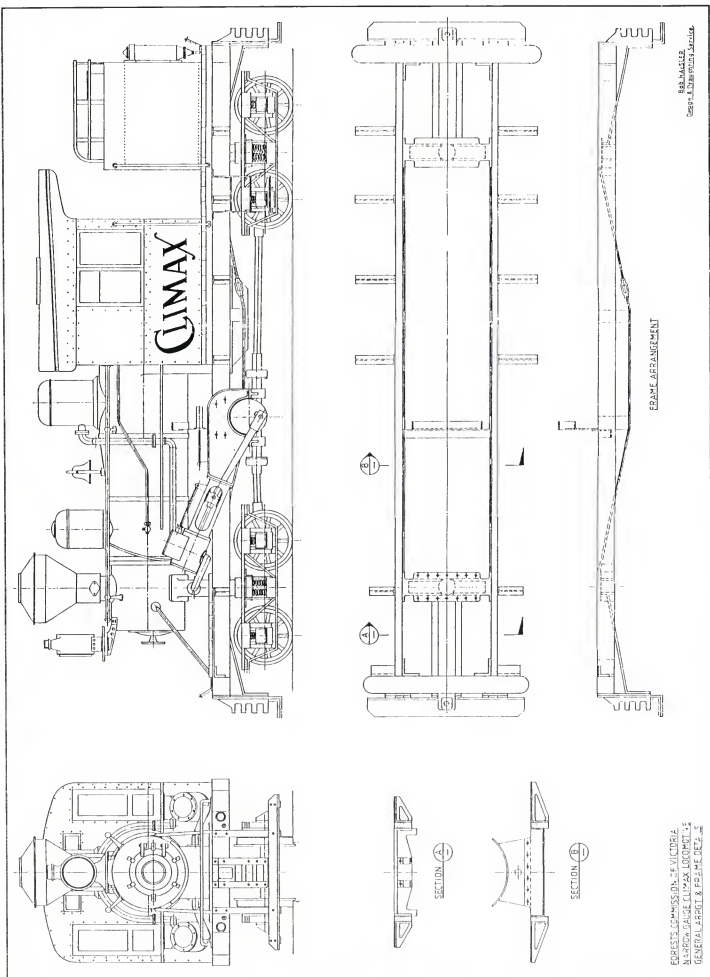
The model

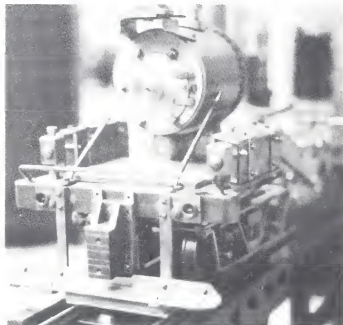
As stated previously, the scale is 0.7" = 1'0" (1:17). This scale came about by converting 2'6" prototype gauge to $1\frac{3}{4}$ " (45mm) gauge. After many hours of climbing in, around, and under the loco, measuring, sketching and photographing, I have produced my final arrangement drawing and detail sketches for the model.

The biggest stumbling block to the start of construction was to find the right gears for the model (a Climax ain't a Climax without gears). I made several enquiries from gear manufacturers and suppliers, but no one could supply them. Finally, I discovered an American magazine called *Steam in the Garden*, which had just started a construction series for a Climax. Although not quite the same as mine, it has the correct skew bevel gears available for the bogies and helical gears for the cross shaft. These gears are lost wax cast-

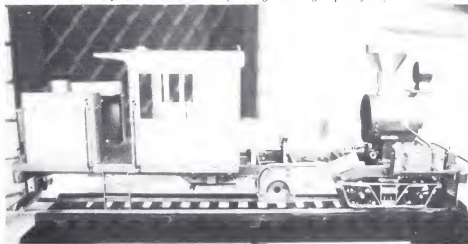


View down through cab roof of model.
Note the grate already in position





Above: front view showing the unique style of buffer beam and heavy duty drawgear
Below: side view of the model at the time of writing. Note angled plate for cylinder mount.



screwed together to allow for any adjustment required for the gear alignment and mesh.

The cylinder assemblies are being fabricated from a mixture of steel, brass and bronze sections. Gordon Watson (of Argyle Engineering) showed me a very simple method for fabricating cylinders from commercially available pre-machined bronze bushes available from the Bearing Service Co.

The bogie side frames are bent up from 6mm x 1.5mm brass bar and bolted together. Bogie bolsters are fabricated from brass bar and the axle boxes and housing will be machined from bronze bar.

The smoke box was turned from a piece of heavy-wall pipe and the smoke stack turned from solid aluminium round bar. The smoke box front and door started life as 5mm thick aluminium plate. The cab and bunker have been formed from galvanized mild steel and brass plate. The rivets are dummy and for appearance only. The plates are drilled and the rivets glued in place.

All that remains now is the installation of cylinders, drive shafts and completion of the bogies before I test run with air.



Cylinder and drive components prior to assembly. Displacement lubricator is also shown (centre left).

The boiler has been drawn and passed to AMBSC standards and will be coal fired. Owing to the size of

the loco, water supply to the boiler is by hand pump only.

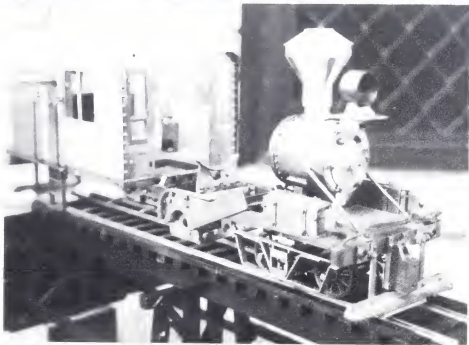
Dimensions are as follows:

Length over all = 20½" (520mm),
Height above rail = 8" (203mm),
Width over cab handrails = 6" (152mm).

I am currently converting my detail sketches into working drawings, and I hope to have a full set of detailed drawings in the near future to enable others to be able to construct what I consider to be a very interesting locomotive.

Finally, I thank the Puffing Billy Preservation Society for their help and co-operation in obtaining the photographs and measurements which enabled me to sketch and prepare my final working drawings.

(Bob will keep us posted on the progress of his Clinax. If anyone would like further information on the Clinax, model or prototype, Bob is willing to be contacted via the AME office ... Ed.)



A final look at the model as it stands so far. The bridge on which it stands is to be part of a display stand.

Steam Chest



with Dave Harper

Hi there, steam fans, and welcome to another potpourri of items from the steam chest. The story of the Goldfields Water Supply in WA continues to generate interest, and I have enough diagrams of Babcock and Wilcox WIF boilers to start a library! Thanks to all the interested readers who have sent me information, I think I've now caught up with the replies!

One of the latest letters was from Mr Oswald Blundell who was the Engineer in Charge of the No 8 Pumping Station until his retirement! I guess this must be as authentic a source as you could wish for. Mr Blundell tells me that Pumping Stations 1 and 3 are set up as museums and No 8 has been taken over by the National trust and has been kept in exactly the state it was in when it was closed down in 1970. He even included photocopies of newspaper clippings recording the closure and re-opening of No 1 station as a museum near the start of the pipeline at Mundaring Weir.

This looks like a 'must see' item for any steam buff visiting WA!

All this information is being kept on file and will be used eventually when the definitive article on the pipeline is prepared.

A model B & W boiler

Another correspondent in the B & W saga has been Bob Williams from South Australia. Bob kindly sent me details of his model boiler plant together with some excellent photos. Photo 1 shows

the front of the boiler, a single-drum boiler complete with shielded gauge glasses and prototypical check valves and expansion loops in the steam lines. The latter can be seen in photo 2 which also clearly shows the Weir feed pump and the high-speed generating engine that is powered by the boiler.

The pictures give no clue to the size of the unit, so I asked Bob for more details. This is what he sent me: the baseboard for the boiler is 18" wide and 22" long; the chimney stands 44" high. The boiler drum is 3.5" dia. by 14" long. The top of the drum is 14" high and the

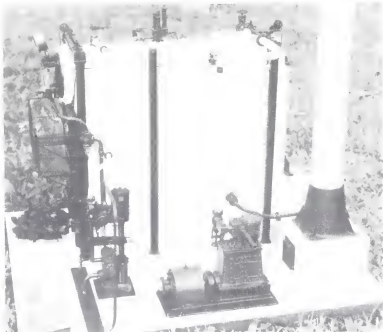


Photo 2 (above)

Photo 1 (below)

brickwork is 6.5" wide. The brick effect was achieved by pressing a heated stainless steel die into the fibreboard for each individual brick! There are 15 x 1/2" dia water tubes inclined at 15 degrees, as per the prototype. Working pressure is 70psi.

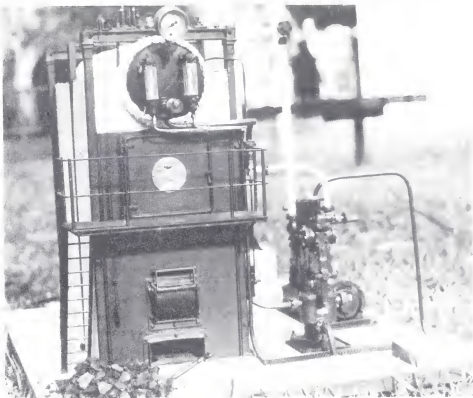
The Weir pump stands 6.5" high, steam cylinder is 3/4" bore, water cylinder 1/2" bore x 1 3/8" stroke.

The generating engine and generator sit on a mounting plate 7" long; the engine has bore and stroke of 1", stands 5 1/2" high with a fully enclosed crankcase. The pump is oil filled and splash lubricates the needle roller big end, crosshead and eccentric gear.

Bob admits that after building the model in 1986 he's never got around to finishing the generator and switchboard! I think we've all been guilty of that problem, Bob.

The boiler is gas fired as solid fuel caused too much heat build-up. The boiler steams freely, the Weir pump ticks over nicely and the generator roars away like crazy!

Bob also sent a picture of his model Tangye Mill Engine which has 1 1/8" bore x 1 1/2" stroke and a 5 1/2" dia. flywheel. The governor apparently works quite well, and Bob cut the bevel gears himself with a flycutter in the mill (Photo 3).



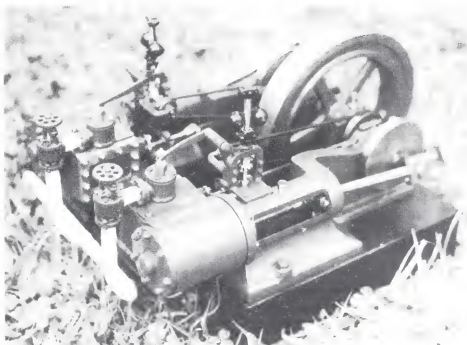


Photo 3

Bob also sent me some great material from his set of four volumes of D K Clark's *The*

Steam Engine — A Treatise on Steam Engines and Boilers published in 1890. This included stuff on the big Worthington duplex pumps as used in the Goldfields Water Supply, plus a number of other large water pumping engines including the Hathorn Davey Differential Pumping Engines similar to the Charters Towers engines. I'll filter in some of the drawings and descriptions as space permits. There are some ideas for really challenging models there, as well as great historical interest.

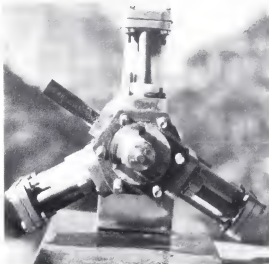


Photo 4

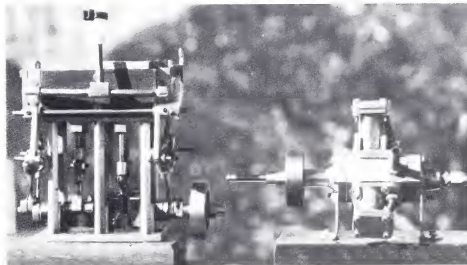


Photo 5

Steam from the snowfields

Another modeller who responded to my plea for pictures is Julian Newton-Brown from the Victorian snowfields. **Photo 4** shows Julian's version of the 3-cylinder radial engine; with bores of $\frac{5}{8}$ " and stroke of $\frac{3}{4}$ " the engine has aluminium pistons with soft packing in the piston grooves. Two of the big ends are forked, the crankshaft runs in a bronze bush and the exhaust exits through the crankcase. The valve 'floats' and is driven by two steel pins that are visible in the photo.

The valve needs regular lubrication to prevent it binding on the face, but given this it idles well at about 45 - 50 revs/min and will rev out from there quite well.

Photo 5 shows the side view of both the radial engine and Julian's twin cylinder column engine. This engine is $4\frac{3}{4}$ " high, bore $\frac{5}{8}$ ", stroke $\frac{3}{4}$ " and has similar soft packing for piston rings. Julian says he prefers the soft packing to O-rings on the pistons as they hold a bit of oil, but he used O-rings in the glands for piston and valve rods.

The cylinders are from brass tubes sandwiched between the two plates and the two engines are mounted on bits of jarrah floorboard planed to shape. **Photo 6** is another view of this engine.

Many thanks for your notes and photos, Julian. We're always happy to feature reader's 'non-railway' model engines in this column!

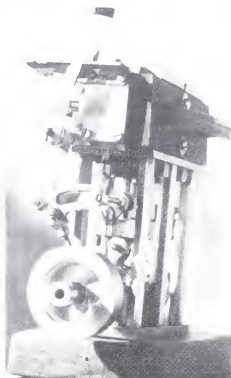


Photo 6

More from the Maurie Turner collection

John Lyas has sent me another batch of his excellent photos of Maurie Turner's collection of model engines which will keep us going for

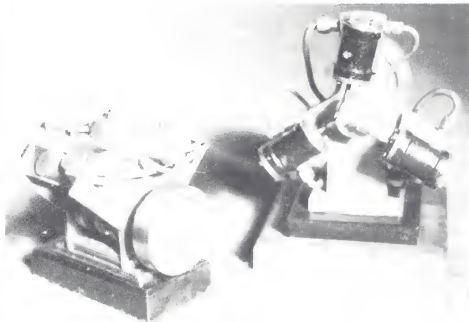


Photo 7

quite a while! This time I've selected photos of types which have all been topical in this column in the past. **Photo 7** shows two oscillating engines, a three-cylinder double-acting radial with a 2.187" dia. flywheel, which makes an interesting comparison with Photo 4, and a V-4 oscillator with a steel flywheel 1.875" dia. The latter engine is a *Live Steam* design, but the radial is a Maurice original.

With duplex pumps featuring lately, I couldn't resist **photo 8**, a very neat unit that seems to differ slightly from the Worthington type. Unfortunately, we don't have any dimensions.

Photo 9 is a neat single cylinder side-crank engine with a 5/4" dia. flywheel. This is a return-connecting rod engine similar to the ones built on a huge scale in the early steamships. The idea was to keep the length of the engine down as the crankshaft was directly connected to the ship's prop shaft. I don't recall seeing this type of engine used as a stationary engine before, but I'm sure someone will be able to point one out!

Supersonic steam

One of my old model boating friends, Fred Lindsay, is also an aviation buff, and we regularly exchange magazines and books etc. Fred pointed out that in the May 1998 edition of the *Aeroplane Monthly* magazine there is an article on the X-15 experimental rocket aircraft of the 1960s. This amazing aircraft set records that stand to this day: a speed of 4,520mph (Mach 6.7), and an altitude of 354,200 feet, or 30 miles! This was achieved between 1958 and 1968 and a lot of the information from the X-15 was used in the Space Shuttle program.

What has this to do with steam I hear you ask. Well, when an aeroplane flies so high that the air is too thin to maintain aerodynamic control, some form of rocket or reaction control is needed. In the X-15 hydrogen peroxide was used, squirted from nozzles at

the extremities of the airframe. This of course, immediately turned to steam in the near-vacuum of the stratosphere, and the resultant mass gave the desired thrust. Unfortunately, the control wasn't always effective, and on at least one occasion the aircraft tumbled out of control and when it re-entered the atmosphere it simply broke up due to the stresses imposed on it.

It seems that each flight went either for speed or altitude, decided by which direction the plane was pointed when they lit the blue touchpaper! It was dropped from under a modified B-52 bomber at around 40,000 ft at the start of each flight, and landed on the salt

flats of Edwards Airforce Base using retractable skids under the tail and a small retractable nosewheel. Those test pilots really needed to be made of the 'right stuff'!

Steam for the tourist

In my notes on places to look at steam engines in the UK recently, I forgot one important place which I had on file. This is the Ellenroad Trust, of Rochdale, Lancashire.

The Ellenroad Mill was built in 1892 as a spinning mill and was powered by a large cross-compound engine built by John McNaught. In its final form the engine delivered almost 3,000hp, and was one of the largest and heaviest mill engines ever used in a spinning mill.

In 1916 the mill was destroyed by fire, only the engine and boiler house survived intact. It was rebuilt in 1919 when the engine and boilers were upgraded. The engine and boilers continued in use until 1975 when electric power was introduced. This made the Ellenroad engine the last of the great steam engines to power a mill.

In 1982 the mill shut down and the site remained derelict until it was bought by Coates Brothers PLC, to build an ink manufacturing plant in 1984. The Coates company decided that the engine and boilers should be saved, and this happy decision led to the formation of the Ellenroad trust which now has a 999 year lease on the engine and boiler house site.

The engine is steamed on the first Sunday of each month using one of the 1919 built boilers, from 12 noon to 4pm. **Photo 10** shows the right hand engine from beside the flywheel. The flywheel is 28ft dia. and weighs 85 tons!

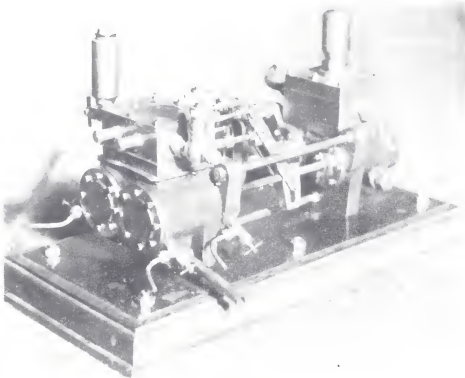


Photo 8

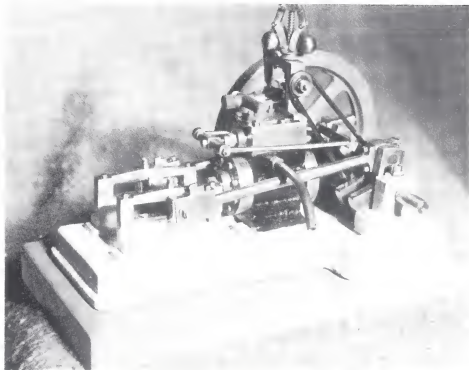


Photo 9

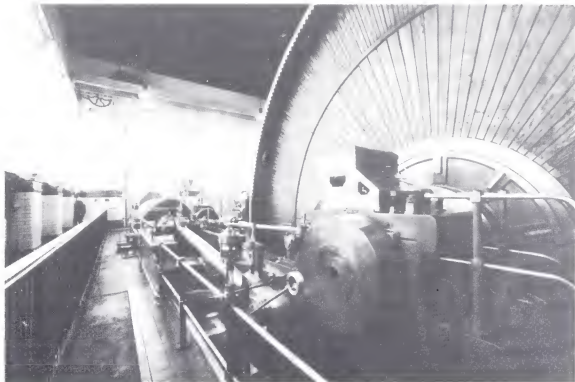


Photo 10

The Trust also steam a 150 year old Whiteless beam engine and a Browett & Lindley generating set, which apparently is very like the Bellis and Morcom gensets that are more commonly known. I am indebted to Richard Unwin, Technical Manager of the Ellenroad Trust who kindly sent me this information and the photo.

Steam on the Net

These strange words:

sandave@bytesite.com.au

comprise my e-mail address, to the uninitiated. After a couple of months access to the internet I'm still only just scratching the surface, but already I have gleaned some great material and made some interesting contacts.

One contact is a Consultant Geologist in Germany who has an interest in man engines. These modified pumping engines were used to carry men in and out of the mines before the introduction of wire rope around 1850 enabled winding engines and cages to be used as they are to this day. There was one built in South Australia in the copper mines that was actually powered by a Bull engine, and my contact has sent me some more information

on what were quite common machines in the early German and Austrian mines.

Another batch of material has just arrived in the mail as I'm typing this! It's details of the huge engines built for the copper mines of the Keweenaw Peninsula in Michigan, USA. I have made contact with the archivist at the Michigan Technical University, and he has mailed me a lot of photocopies from their archives watch this space!

That is enough for this time, until next issue, happy steaming!



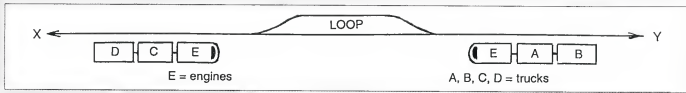
A Shunting Problem

This shunting problem did the rounds when I worked for Victorian Railways 1929-38. Two goods trains approach each other

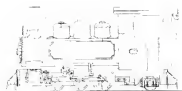
a single line and meet each side of a passing loop. The loop is too short to hold either train, but can hold an engine with half its

truck rake. How do they pass? There is no free or loose shunting. (Answer next issue)

Stan Allison



Bunyip



A Bundaberg Fowler 0-6-2T in 7¼" gauge — part 4

By Ian Smith

Drawings by the author unless credited otherwise

Smokebox saddle

The smokebox saddle is of welded fabrication using 6mm and 8mm plate. Also required are two 25mm steel 'weldable' commercial steam pipe bends (Blackwoods part no. 03130003) to make the exhaust pipe which extends from the cylinders to the blast pipe, and a 25mm pipe extension to be welded on one end of each bend.

Mark out the front and back plates as per the drawing and cut to size. Note, you also have to put a 3½° bend in both of them, 80mm up from the bottom on the front plate and 90mm up on the back plate. Make the two side plates from 8mm plate as there will be 2mm to be machined off each side after the saddle has been completely welded. Mark out the exhaust and the steam inlet holes and drill them but not the other holes as they will be drilled on assembly. The two 40mm radius side-plates are made from 80mm nominal bore pipe x 157mm long, cut in half with about ¼ of it flattened between two solid steel plates in the press to give it the required shape. Fit to the front and back plates before cutting to the final size — do not forget to allow for the 6mm length that will sit on the

main frames after the sides have been machined.

The next step is to roll the plate to take the smokebox mounting. Depending on your bending rollers, the plate may have to be made longer so there are no flats on either end of the finished radius. Use 8mm plate x 157mm wide. The radius is 162mm after it has been machined — do not put the cut outs in before rolling the plate as there will be an uneven radius where the cut outs are made. Now, mark out for the cut outs and the hole for the exhaust pipe, drill the 25.4mm hole and cut out the openings ready for welding. The cut outs give access to weld the exhaust pipe in and for the fitting of the cylinders. Cut three pieces of 6mm flat plate 15mm, 30mm and 45mm x 299.15mm long. These are stiffeners to be welded in after the exhaust pipe is welded in place.

Clamp and tack-weld the saddle together and check for size and squareness before welding up the exhaust pipe. Check the 299.15mm inside frames, mark out on a piece scrap plate the shape and finished size of the exhaust pipe and weld on the extension. Cut the other end of the bend through the centre line and weld the two bends together. Now, cut the assembly to finished size and tack in place. Weld the exhaust pipe completely in. The stiffeners can now be tacked in if all is still square; weld the saddle up completely — it is now ready to be machined.

Clamp the saddle, on its side, to the vertical milling machine table with the 6mm overhang in the tee slot and push it hard up against the edge of the tee slot. That will line it up as if it is sitting on the main frames. Weld an angle plate to the saddle and to the table, to help keep the saddle nice and square (the welded face will be a bit warped, so will give the setup some rigidity while machining). Machine off 2mm in light cuts, reverse and repeat on the other side, bringing the over all size to 311.15mm. Clamp two angle plates of the same size one to each end with the 6mm overhang resting on the top of the angle plates as if mounted in the frames. Now set the entire setup parallel to the table travel. Clamp the milling head to the centre of the saddle, rotate the milling head 90°, mount the boring head with a

solid boring bar set at 162mm radius. Take a light cut across the smokebox face, continue taking light cuts and machine down until it measures 31mm above the top of the angle plate. Rotate the milling head back to vertical and machine the recess for the blast pipe. Clean up the face till there is a flat surface 50mm x 76mm. That finishes the milling.

Mark out the holes for the brake brackets. Drill and tap one hole 6mm, clamp up the bracket and drill and tap the other hole — leave the brake hangers mounted. Put the saddle between the frames, lining up the exhaust holes on both sides. The other holes can now be drilled in the saddle using the frames as a drilling jig. Leave the ten smokebox mounting holes till the smoke box barrel is made.

Spings and spring buckle

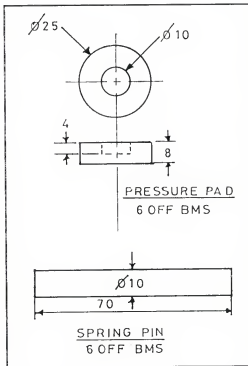
The springs are easy to make from 25mm x 1.6mm spring steel. There are seven leaves in each assembly. The top leaf has a 10mm hole located 13mm in from each end and a 4mm hole in the centre of the spring, 3 holes in all. The second spring has half a hole in the end of it — the way to do this is to make the spring longer and cut it off after the spring has been drilled. The spring steel I used was all ready hardened and tempered (from S&S Springs in Melbourne). I made a punch and die and used the press to punch the 10mm holes and used a 4mm tension drill to put the centre hole in.

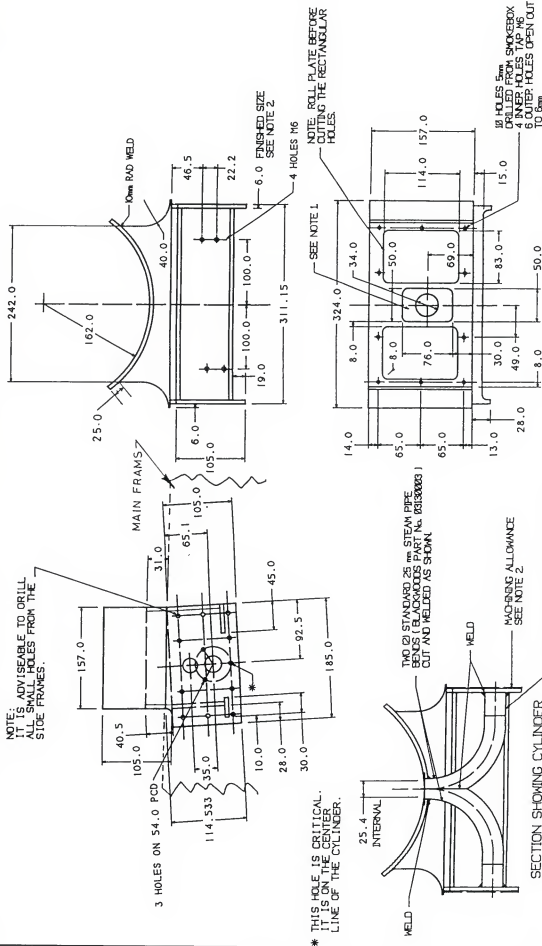
The buckles (six off) are fabricated 25mm x 12mm x 26mm long and drilled to the drawing. The top of the buckle is bent up from 25mm x 3mm and silver soldered together. Drill the 4mm hole from the base block.

Spring pressure pin and pad

The pin is made from 10mm diameter BMS x 70mm long, faced both ends. The pressure pad is made out of 25.4mm diameter BMS x 8mm long, faced both sides and with a 10mm slot drill, drill in 4mm deep. Now the springs can be assembled on the loco, fit the welded nut and washer till the thread comes through enough to be able to fit the lock nut. The springs can be finally set after the boiler is fitted.

To be continued...





TITLE				TRAINFORREST GARDEN RAILWAYS			
SMOKE BOX SADDLE				BLN/JP 045-2 LOCO FOR 7 1/4 IN GAUGE			
DRAWN	D.L.D	SCALE	REV. 5	DRAWN	D.L.D	SCALE	REV. 5
DATE	9-7-96	DRAWING No.		DATE	9-7-96	DRAWING No.	
CHECKED	A.J.N			CHECKED	A.J.N		

MATERIAL: 6mm MS PLATE

NOTES

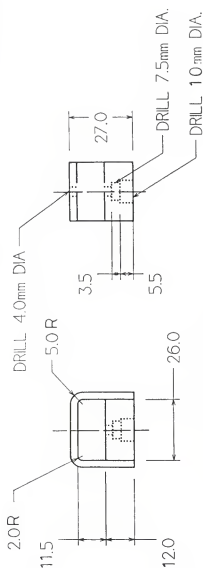
1. ALL WELDING PROCESS TO BE MACHINE PLAT AFTER ASSEMBLY.
2. MAKE SITE PLATES FROM 8 mm MS TO PROVIDE FOR A 2 mm MACHING ALLOWANCE AFTER WELDING.

BLN/JP 045-2 LOCO FOR 7 1/4 IN GAUGE

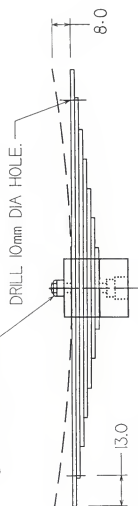
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BUN-009



M4 x 25mm HEX SET SCREW
TURN 0.5mm OFF UNDER HEAD
FIT 'NYLOK' NUT AND BURR
OVER LIGHTLY.



SPRING TO BE CURVED TO 575mm rad.
TENSION IS CORRECT WHEN SPRING
IS HORIZONTAL WHEN ON LOCOMOTIVE.

SPRING LENGTHS

35mm
60mm
85mm
110mm
135mm
162mm
186mm

Material
1.6 mm x 25.4mm Spring steel.

TRAINFOREST GARDEN RAILWAYS

TITLE BUNYIP 0-6-2 LOCOMOTIVE FOR 7 1/4" GAUGE

SPRING ASSEMBLY

DRAWN	D. L. O	SCALE	FULL SIZE	REV. 0
DATE	4-7-95	DRAWING No.	BUN-003	
CHECKED	A. J. N			

BUNYIP 0-6-2 LOCO FOR 7 1/4 IN. GAUGE

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Garratt Gossip



with John Cummings

I was talking to our Editor after his recent visit to the Model Engineering Exhibition in Melbourne, when I mentioned that I was searching for a book titled *Steam in Africa* by A E Durrant, Jorgensen and Lewis. This book has photos of Garratts that are not in the book *Garratt Locomotives of the World*. David suggested I contact Train World, Ph. (03) 9596 6342, as he had visited this shop while in Melbourne and was astounded at the num-

ber of new and second hand books they had on railways, tramways, locos, etc. I rang Train World and bingo! They had the book!

In the last *Garratt Gossip* I mentioned that Peter G Wardle of UK had asked me to be his agent in Australia. I can now say that I have the drawings in 2½" gauge of the KUR/EAR Beyer Garratt EC3 and the British Industrial Garratt. The KUR/EAR Garratt has a 4-8-4+4-8-4 wheel arrangement while the

industrial Garratt is an 0-4-0+0-4-0.

Having looked at these drawings, I feel that this industrial Garratt would make a powerful 5" gauge loco which would be easy to transport. Basic dimensions in 5" gauge would be:

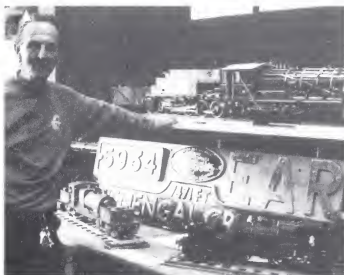
Length (over buffers)	1441mm
Height	343mm
Width	260mm

Included in the drawings are half full-size drawings of the builder's plate for each of the locos.

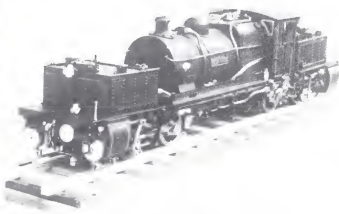
Peter also enclosed a general arrangement drawing of the Darjeeling — Himalaya Railway Garratt 0-4-0+0-4-0, which was 2ft gauge (610mm).

Have any of our garden railway enthusiasts ever thought of building a Garratt?

Lately, I have been asked "When will we see the K1 running?" Well I had hoped to have it running next Easter at Edgeworth, but those little things keep popping up which delays my schedule. I have intentions of running on air after Xmas.



Peter Wardle proudly shows off some Garratt models and full size plates. The cables attached to the models (below) are for security



William Francis, the British industrial Garratt which picked up 2nd prize in a 1995 Exhibition.



Recently one of our readers gave me some newspaper clippings about K1 which he had collected. One of these clippings was about the 7¼" gauge K1 built by Milner Engineering (UK). This loco was not built as a compound. In the specifications list it was mentioned that they had used High Pressure fluorocarbon stainless steel braided flexible hose instead of a ball joint as per original.

Have any of our readers built Peter Lukey's small tube bend-ers? I can highly recommend them. I have made one to suit ⅜" copper tube — I altered part 5 to suit ⅜" radius.

Setting Up A Model Engineer's Workshop — part 2

Story and photos by Steve Reeves

Drawings for publication by Peter Shute

The ideal machine has a vertical head which can be tilted horizontally. Second hand machines provide an alternative. Many people buy very old machines, some of which were made during or before the second world war and have huge and heavy cast main bodies. They can be picked up at auctions or second hand machinery places. While very strong and thus able to resist movement which generates chatter on the work face, most are badly worn out and will require stripping down and rebuilding. Such time and effort really pays off! A machine can be bought cheaply and once done up, produces excellent work. So if you have the space (they take up quite a bit!) and plenty of time on your hands this is a very practical solution.

For those requiring a machine that can be used straight away, a mill/drill is another op-

tion. As the name suggests, it is half way between a milling machine and a drilling machine. It is much lighter in construction than a mill so is limited in the size of cuts that can be taken before chatter becomes a problem. However capital outlay

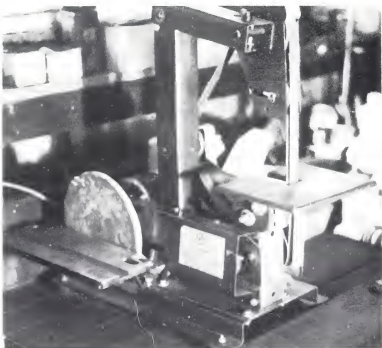


Photo 10

is much less (about 1/3 the cost). **Photos 8 and 9** show what I've got. It can handle very large cutters and like the bandsaw, has proven to be a very useful machine. So far I have milled out 5" gauge locomotive mainframes, 7/4" coupling and motion rods, and drivers brake valves to name a few. It could do with a power driven table, a refinement I will add later but apart from this works very well.

I have bought many accessories for it. **Photo 10** shows some of these stacked under the machine on the home made stand. By the way I got this machine out of its packing crate and onto its stand on my own! The compound machine vice can be swivelled 180 degrees and was well worth the extra cost of purchasing it. So was the rotating table (a mill's version of a face plate). It is used for milling circles such as the ends of coupling rods or circular ports.

I have also purchased a dividing head and tailstock with centre, for gear cutting (good for traction engines). I also have a big clamp set on the back wall (**photo 8**). This will clamp anything and is the type that uses a long slotted bar at the top, with height adjustment via a stepped triangular block, all held down by various length bolts that go through the slot in the middle. A collet set provides an effective means of securing the milling cutters to the head instead of the drill chuck which had been provided with the machine (the drill chuck is not designed to take the side-ways thrust generated while milling). This prevents the milling cutters from falling out while in use. A most dangerous act!

Note — the coolant pump and tank are shared by both the lathe and mill/drill.

Machinery care

After use, machines should be meticulously cleaned down with all coolant and swarf removed. They are then sprayed with anti-rust fluid and a dust cover placed over them. This is particularly important if the workshop may also house your car. Also condensation due to the change of temperatures over a 24 hour period will start rusting on all metal surfaces.

Dust covers can be as simple as old bed sheets or custom made. These are particularly

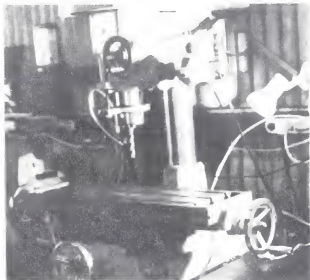
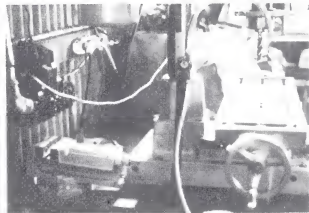


Photo 8 (above) Note extra lighting and powerboard with 10 Amp circuit breaker. **Photo 9 (Below)** Note compound vise and clamp set on wall



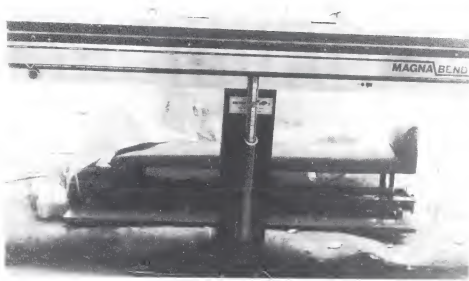


Photo 11

useful if you leave the workshop over long periods of time (more than a few days).

Finishing machine

The finishing machine, like the bandsaw has proven to be one of the most valuable machines in the workshop. My own shown in **photo 10**, I believe is normally used for wood working and has been fitted with metal cutting belts. The more traditional type is horizontal and is driven by a motor similar to those used by the grinder. These machines come in various belt lengths and widths.

An example of how useful these machines are — when I needed to make up four pairs of brackets with an "S" shaped back. In pre-finishing days this was done using drills, hacksaw and files. A very physical task taking several evenings work. The whole lot was done over a 3 hour period with a high standard of finish being obtained.

Tip — keep a tray of water handy as the job will heat up and tender fingers are sure to find the hot spots!

Miscellaneous machines

The following items are ones which I do not have at the time of writing. I have however used them and would like to offer the following advice for anyone who may be thinking of purchasing them.

Hydraulic press

This is the next major item I will purchase for the workshop — so far I have sourced a local manufacturer. They are normally used by the automotive industry, which is an advantage to us, as they are both reasonably priced and easy to get hold of. The type I am looking at uses a hydraulic jack mounted at head height in a fabricated frame about 2 metres wide by 3 metres tall. This has a table for the work at about lower chest height.

What will it be used for? Any large items that need to be press fitted, such as wheels/ fly cranks on axles or chimney caps on chimneys. Other uses include boiler plate flanging and

stamping out fabricated components like traction engine wheel spokes.

Set of rollers

Plate work such as cabs, tanks, etc for 7 1/4" gauge locomotives can get quite large. For small projects the bench vice and pieces of angle will do most jobs, however boiler barrels and cab roofs need something better. A set of rollers can be of help here.

There are many articles on how to make these in the model engineering journals. They can also be bought commercially. Most people purchase a size which can easily be mounted on a bench top. Once again it is the size of the project versus the cost that will determine what you should choose.

Bending brake

These usually come in large sizes (2 metres or larger). Due to the large amount of space taken up by these machines, it may be better to farm the work out to a sheet fabrication manufacturer. This many prove to be a very economical as well as practical exercise, and will enable you to work on some other part of your project while these parts are being made.

Purchasing a bending brake is therefore determined by a balance between cost, convenience and space. **photo 11** shows one that is on loan to me and can bend up to 2 mm thick sheet.

Shaping machine

Back in the early days of machine shops this type of machine played a very important role. Today most modern machine shops don't use them. As a result they are not seen in large numbers in the home workshop. However those that have them say they are very useful and wouldn't be without one. Like the milling machine talked about earlier, many people buy the large older units and do them up.

What are they used for? Mostly for roughing out odd shaped jobs, particularly when

large amounts of material need to be removed. They are enjoyable machines to use and watch in motion. They thump as they cut, and clap as they pull back. They can remove material very quickly.

Surface/cylindrical grinder

A high precision grinding machine, and a very important part of a tool maker's workshop. They are used for very accurate machining of a surface or tool.

If you are the type of person who enjoys making tools, jigs and fixtures, this is a machine for you. If you are not that type of person then you may wish to spend money elsewhere.

Chain block

Photo 12 shows the latest equipment bought in for the workshop. It has a 1 tonne carrying capacity and was bought to lift components of a large 7 1/4" narrow gauge steam engine I am working on.

Chain blocks are used in most machine/automotive workshops, so they can be obtained easily second hand. In my case however I found that most places used 2 tonne units which proved to be physically too large to fit into my workshop. As a brand new 1 tonne unit was almost the same price, I purchased this instead and got the bonus of warranty cover as well.

It has been mounted on an "I" beam complete with a trolley which slides up and down

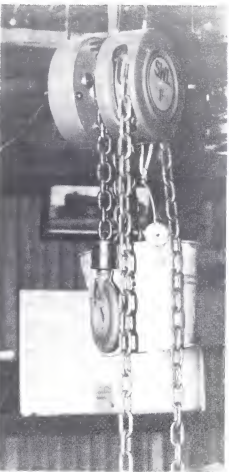


Photo 12



Photo 13 (above) and Photo 14 (below)

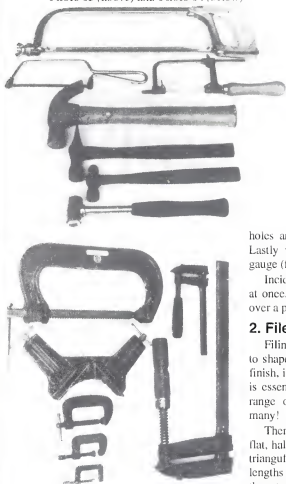


Photo 15

the length of the beam. I have made up a series of lifting jigs, chains and "U" bolts to help with the lifting procedure and I can hear the sounds of joy coming from my back as it is no longer required to lift things it shouldn't. It should never give me trouble again!

Hand tools

1. The basic kit

Hand tools are the most important part of your workshop, so it is important to set up a good collection. Lets look at some in detail.

In **photo 13**, we have a 150mm ruler, two 300mm steel rules and a 5m tape measure. Also seen are two engineers squares — one 50mm tall and the other 170mm tall, a home made *centre finder* for round bar and next to the scribe, three different sizes of *centre punch*. (note the small one with the magnifying glass attached — very handy for small jobs).

In **photo 14**, you will notice four sizes of *hammers* of three different types and a soft head hammer for beating copper etc. Also there are three sizes of *hacksaws*.

Turning now to **photos 15** and **16**, we see "G" clamps in various sizes. Carpenter's clamps are also useful as are vice clamps (not shown). There are *tin snips* for sheet metal work and *scissors* for paper gasket material etc. Also seen are *chisels* for sheetmetal work. For accurate work (**photo 17**) I have two *micrometers* — one 0-25mm and one 0-1" and soon I will be purchasing even bigger ones. Less accurate but mighty useful are the "dial" and "standard" *Vernier gauges* (0-150mm). Also found useful is the telescopic gauge for measuring holes and a set of "feeler" (or slip) gauges. Lastly we see a *wire gauge* and a degree gauge (for measuring angles)

Incidentally I did not buy all these things at once, but have collected them one by one over a period of time.

2. Files

Filing and finishing off with emery paper to shape parts and to provide a good surface finish, is something you will do most of. So it is essential that you select and keep a good range of files. **Photo 18** shows some of many!

There are 5 basic shapes — flat, half round, round, square and triangular. They come in various lengths of which I have found three to be useful.

My needle files, which are not shown are very small in size and used for all fine and accurate work.

The next size I use are 150mm long. These are used for materials up to 5mm thick and are my general purpose files. My biggest ones are 250mm in length and are used for all heavy projects.

Files are manufactured in different types commonly known as first cut, second cut and bastard. These terms refer to the layout of

the teeth and thus the amount of material that the file can remove from the job in one stroke. I also use files that have no teeth on one edge — These are used in corners or where better control when removing material is needed.

My files hang on a special rack which prevents them from touching one another. They are all fitted with handles as well. (Never use a file with out a handle of some sort as the point can make mince meat of your hands). They have been arranged in four basic groups depending on what material they are to work on. These groups are stainless steel, soft metals (copper, aluminium, soft solder etc), brass and lastly general purpose.

Chalk is used as a teeth de-clogging agent and I also have a cleaning brush. (*An old toothbrush with the bristles cut down to a length of about 2 or 3 millimetres makes an excellent file-cleaning brush ... Ed.*). Keeping them in these separate groups increases their life, quickens time taken to do the job and improves the quality of finish.

Footnote

The following items (3 to 6) are available in both metric and imperial sizes. As our hobby tends to use a mixture of both units of measurement, you must decide which you wish to use. This will be based on which units you are familiar with. Bear in mind that the world as a whole is going metric and it is only a matter of time before the hobby catches up. Thus metric tooling will be cheaper to purchase and more readily available. Personally I grew up during the change over period that occurred in Australia. I am conversant with both units and this is reflected in the workshop and this series of articles. However as new and replacement items are bought, these are metric. All my design work is also done in metric.

3. Drills

Drills come in a large range of sizes. I find that I tend to use four different groups.

Group 1 are small size, general purpose. They consist of a box of drills ranging from 0.05mm to 5mm in 0.1mm increments. They



Photo 16



Photo 17

are used in place of Number and letter drills. They are used in conjunction with a drill conversion chart (0mm to 25mm and shows thousands of an inch)

Group 2 are large size, general purpose. At present these are still imperial sizes. They came on a round stand ranging from $\frac{1}{16}$ " to $\frac{1}{2}$ " in $\frac{1}{64}$ increments.

Group 3 are small size, one offs for things like blower nozzles, injector cones etc. They are less than 1mm diameter. I have made a special centre drill for these and they are held in a special pin chuck. See **photo 19**.

Group 4 are large size, one offs. These are over 12mm in diameter and are used as

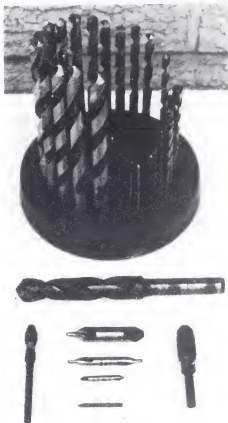


Photo 19

tapping drills for large threads, pilot holes for boring operations etc.

4. Reamers

I use parallel reamers in preference to the adjustable types. For this I have received criticism as one adjustable reamer can do the job of several parallel sizes and thus can be very cost effective. This is quite true but is offset by the fact that adjustable reamers take time to set up correctly. This effects the time taken to make things particularly if you are making a production run, of say clock valves for instance, where you want every thing to hand and can change from one tool to another and back again.

I have a set that ranges from 3mm to 16mm diameter. I also have the odd larger size for honing bearings and the like. After this I change over to boring.

Adjustable reamers come into their own for things like honing worn cylinder bores where they can gradually be adjusted larger until all the scoring has been removed.

5. "D" bits

Shown in **photo 20** are "D" bits. These are half way between a reamer and a boring bar. They are used to give a drilled hole a flat bottom and used in conjunction with a reamer, provide the perfect seat for a ball valve on boiler fittings.

They can be purchased or made. I have a combination of both ranging in size from 3mm to 12mm diameters.

6. Taps and dies

Unfortunately there is no one standard for threads which has been adopted world wide. This means there are many different types available (just ask a mechanic!). So which should we adopt?

For any one starting from scratch the metric system although not perfect, will suit most needs and can be backed up by other thread types if need be. The basic rule is — the smaller the thread, the finer the pitch. The bigger the thread pitch, the coarser the pitch.

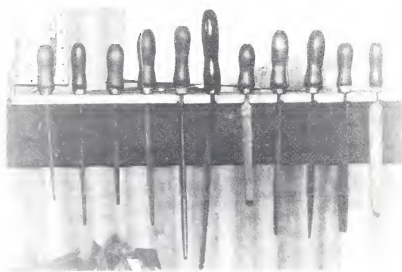


Photo 18

When I started 20 years ago my first engine was built to an English design. I therefore adopted the thread types as specified in the drawings. These are a combination of imperial and metric sizes. This has been refined over the years. At the present time the threads are still easily available and at reasonable prices.

As a guide I'll describe what I use.

Thread types:-

- A. BA 0, 2, 4, 5, 6, 7, 8, 10 and 12
- B. ME x 40T 1/8, 5/32, 3/16 and 1/4.
- C. ME x 32T 5/16, 3/8 and 1/2.
- D. Brass(26T) 3/8, 1/2, 5/8 and 3/4.
- E. BSW 1/4 upwards
- F. BSP 1/4 upwards



Photo 20

A. BA series

This is a metric size used in the electrical industry. It has the advantage of providing very small nuts and bolts. Very good for small scale projects. 8BA is about the smallest practical size, with 10 and 12 really just for decoration.

Tapping requires a delicate touch. You will see in **photo 21** a special tap wrench. This type gives better control and reduces the chance of the tap breaking.

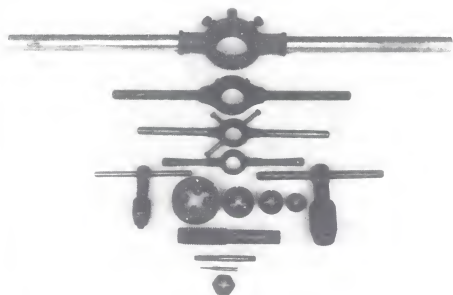


Photo 21

I try not to tap into a "Blind hole" where ever possible preferring instead to use a hole that has been drilled straight through and therefor is open at both ends. If I do need to tap into a blind hole, I only tap half way down.

B. and C. The Model Engineer threads

These sizes were used extensively by the late L.B.S.C. designer of miniature steam locomotives and have therefore become very popular in our hobby. They are an imperial thread with the fine pitch being 40 threads per inch and the coarser at 32 threads per inch. Like the BA sizes, they are very good for small scale work, used mostly on things like boiler fittings, mechanical lubricators and the like. The coarser thread gives a stronger fitting and is also a little easier to work with.

D. Brass threads

As the name implies, this thread is designed to be used with brass and bronze. It is an imperial thread using a pitch of 26 threads per inch. As it is still used by industry today, it is still easily obtainable. In fact I use it for all non-ferrous materials. It threads very quickly and is very strong.

E. Whitworth system

It is at this point that metric threads can be substituted easily. Nevertheless this is still the most popular imperial thread in use today.

This means that taps, dies, nuts and bolts are easily obtainable and can even be found in the local hardware store.

At sizes of .25mm dia and over it becomes more practical to move away from taps and dies, screwcutting in the lathe instead. So far the biggest thread I have used is $\frac{3}{4}$ " (19mm), so thread cutting in our hobby is not that common. It is however a more accurate way of making a thread.

I have found die nuts to be very useful.

These are designed to repair a damaged thread rather than tap a new one but can be used in emergency if need be. They can also be used on soft materials like brass or wood, thus providing a cheaper alternative.

F. BSP threads

These imperial size threads are used in boiler fittings for steel boilers. They are mainly used to attach small fittings which it is impractical to flange mount. *The Australian Miniature Boiler Code* specifies which sizes to use and I have been buying these sizes as I need them.

Present practice is to purchase taps only. Commercial plugs to the correct size are purchased and then silver soldered onto the appropriate fitting. This is because BSP threads are tapered. Thus the more you tighten the better they seal against steam pressure, so increasing the safety aspect.

Marking out

How accurately you build your project, how well it performs and how well it looks all depend on how accurately you

have measured and marked out the components. So it is well worth spending time and money on marking out equipment. **Photo 22** shows what I use.

A. Surface table

The one shown in **photo 22** was given to me a few years ago and is the type used by tool makers. The job to be marked out is placed on this with the other marking out tools as well.

A surface table is basically a very accurately ground piece of steel. Surfaces for these must be dead flat. Some examples are a sheet of glass or a slab of marble. An ideal size is 300 x 700mm by 10 to 15mm thick. The drill press, mill drill tables or the lathe bed could also be used.

B. Height gauge

There are 2 types shown here. The first is a converted Vernier gauge stood up right and placed on end in a special base block. A piece of tool steel has been clamped in one of the jaws for scribing with. This was made by a toolmaker many years ago and found in a second hand tool shop.

The second type is basically a scriber mounted on a vertical stem, which can be adjusted both up and down as well as side to side. This type is more common and I use it for valve gear setting, marking flange width on boiler plates and marking hole centres on flat bar, etc.

To be continued ...

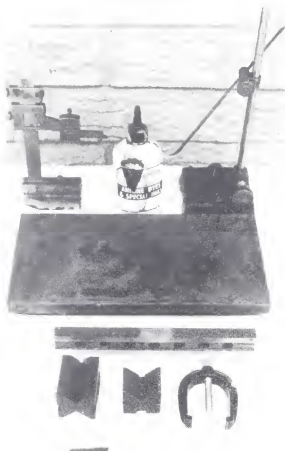


Photo 22

One Man's Boats

Story and photos by David Shearing

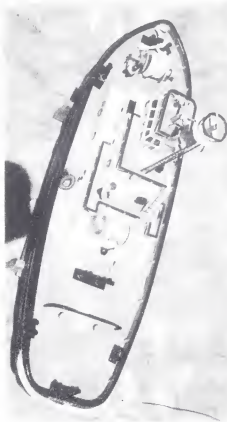
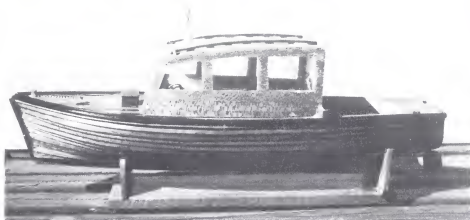
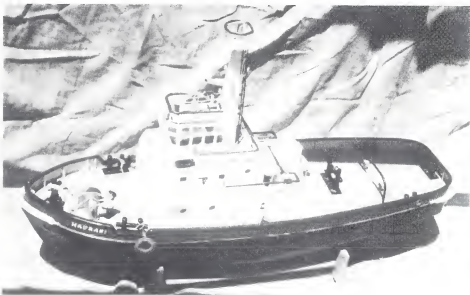
These photographs represent some models I have built since retiring. One is a harbour launch, clinker planked to my own design. The police launch is based on one used by the police on Sydney Harbour during an earlier period — a time I spent on the harbour cruising and fishing

The *Hauraki* is based on the article in AME issue 50 (Sept-Oct 1993). It is about 800mm long and is strip planked and glass fibre covered and is driven by a small motor and 2:1 gearbox driving a 2½" propeller. The top fire unit is supplied with water using a windscreen washer pump and it works quite well on 10V.

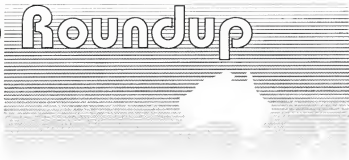
The crew models are carved from wood and painted. The motors are mainly from old computers and printers etc. and they work well on rechargeable batteries. All models are radio controlled using Hitec® 2-Channel units. The motors are controlled by a switch featured in AME (May-June 1996) and they all have three speeds ahead and astern. Being permanent magnet types they are easy to reverse.



The three boats referred to are (clockwise from top right): the Hauraki, the freelance clinker-built launch, the police launch and finally, a view looking down on the deck of Hauraki



Club Roundup



compiled by Neil Graham

Auckland NZ

Auckland Society of Model Engineers

Consideration by the safety committee has been given for the fencing off to restrict public access to the steaming bays.

Bits and pieces nights continue to be popular. Some recent highlights were Alan Roberts' horizontal flat four aero engine, Graeme Quayle's single cylinder piston valve vertical engine.

The Tuesday club have been busy levelling the top curve of the track. Due to seepage into the archive room, it has been decided to purchase and install a de-humidifier to preserve all the archived material.

Scale Marine Modellers

The postponed sailing day of 16th August was held on the 23rd. With no wind it was deemed a mercantile steering day only. Eleven members run the tight course set by the sailing committee. Due to some excellent work by the skippers and the resulting tight scores, some more devious courses will need to be devised.

The annual static competition on 12th August last attracted 14 models. Four sailing, four warships and the rest were merchant ships.

ASME Inc. and SMM shared facilities

Location: Peterson Road Reserve, Waipuna Road, Panmure

Public Running: Every Sunday

Berkeley USA

Three new track panels have been installed on the passenger loading track. The Pacific loco has been reassembled and re-painted, with the tender to go. The Atlantic is running OK. 200ft of inside loop track has been repaired and re-gauged. The club has recently attracted three new members.

Golden Gate Live Steamers Inc.

Location: in Tilden Park, Loma Calientes & Grizzly Peak Blvd., Berkeley CA.

Public Running: ???

Capalaba QLD

Members of the RMECI are particularly proud of their new track, which they have constructed over the last 10 months. The 7¼" gauge track is approx. 400 metres long, with a 12ft turntable, three steaming bays and a crossing loop.

The track runs through parkland, bordered by Tingalpa Creek and bushland. After leaving the station (yet to be built) area, the track runs downhill over two long viaducts to a set of points, then into a sharp curve then onto a long steep section that tests any steam loco, then back to the station area.

The club has surveyed the next section to be built — about 350 metres.

All enthusiasts are welcome to the club's running days.

Redlands Model Engineers Club Inc.

Location: Sir John Fredrick's Park, Banfield Lane, Capalaba

Public Running: 1st and 3rd Sunday

Cape Town RSA

The new clubhouse nears completion. All that needs to be done is electricity, water and drainage connections, plus some security arrangements.

The members eagerly await the completion of the clubhouse, as after that, the priority of track laying can commence.

Western Province Live Steamers

Location: 5th Avenue Sports Complex, Parow

Public Running: ???

Casino NSW

Casino recently had an interruption to their operations when some 60 metres of track was torn up as a result of a police car chase across their grounds! But the interruption was short lived as the members got stuck in and had all the repairs effected for the next timetable running day!

Pacific Coast Railway Society Inc.

Location: Cnr Queensland Rd and West St, Casino

Public Running: 2nd Sat & 4th Sunday

Christchurch NZ

The members have posed themselves the question of club direction for the future. The current site at Andrews Crescent has reached its zenith, and no further development is possible. The committee have been investigating possibilities of extra or an alternative site which could include 5/7¼" gauge ground level railway and an elevated track for 5/3½" gauge. The committee has shortlisted the Marylands Reserve as a suitable site. Initial

meetings with council have been favourable and discussions are still taking place.

New rules for non-steam locos have been discussed covering several areas of their operations. New coal bins are under construction.

The Boatec 98 show has come and gone and many members turned out (20 in all) to put on a great display for which we can be proud.

Canterbury Soc. of Model Engineers

Location: Andrews Cres, Christchurch

Public Running: 1st & 3rd Sunday

Fairfield NSW

The track re-construction is now in the final stage with some 60-70 metres of concrete for the base now complete. Also being completed is the re-sleepering of rails and the changing of the light rail to a heavier rail section.

With track inspection/registration soon to be upon us the big cleanup and maintenance program is in progress.

Western Districts Live Steamers Co-op

Location: Fairfield Showground, Fairfield

Public Running: Every Sat & 3rd Sunday

Galston NSW

To culminate the 25th Birthday Anniversary celebrations, a dinner was held at a local bowling and sports club. It is pleasing to note that more younger members are making themselves available to serve on the Board of Directors.

Repairs to various buildings and amenities have been completed. A new rail triangle from inner loop to old concrete bridge line to allow scale timetable running. 60 metres of track from the iron bridge to the approach of Rabbit Flat is to be replaced with heavier 25 x 10mm section rail.

The boating group has completed a new wharf at Fagan Park.

Hornsby Model Engineers Co-op Ltd

Location: 29 Mid Dural Road, Galston

Public Running: 2nd Sunday

Gisborne VIC

It has been a successful year for the club. The 7¼" gauge portable track was completed and has been run at five locations with good earnings being realised.

The 1998 Rally was a success with record gate takings. There were many new and interesting exhibits. The tractor pull participants were down a bit but it was still enjoyable.

The Gisborne Vintage Machinery Society Inc.

Location: Gisborne Steam Park, Webb Cres., New Gisborne

Public Running: 1st Sunday

Gosford NSW

Two badly needed 5" gauge riding trolleys under construction are nearing completion.

Also in hand is the 5" gauge access to the trestle bridge via a new diamond crossing.

The new toilets have been commissioned (so to speak). The ride on mower from the Gosford Council is now in service and will be returned for updating in two years if we keep it in good order.

Running Days for the last four months have been well attended with between two and eight locos doing the honours as required.

Central Coast Steam Model Co-op Ltd

Location: Lot 10 Showground Road, Narara

Public Running: 1st Saturday

Hobart TAS

Club membership is now 25. The 220 metres of dual gauge elevated track is now being upgraded. A 40 plus metres section of the top curve has been replaced with a steel purlin base and new track laid in slotted treated pine sleepers. The previous tight sections have been removed.

A night run was held in July. A fairly balmy night ensured a comfortable night was had by those who attended. The Code of Practice has been extensively revised and simplified to give a practical and commonsense statement of safe operating practices. New members will be made most welcome.

Membership enquiries to (03) 6243-7173.

Hobart Miniature Steam Locomotive Society Inc.

Location: Flagstaff Gully Rd, Lindisfarne

Public Running: None

Invercargill NZ

The club has been invited (in conjunction with the Gore club) to take part in the River-ton Model and Miniatures Show next March 20-21, using the portable track.

The committee has approved to have the station wired and this has been completed. The riding trolley has been re-furbished and fitted with new wheel bearings.

The activities of the boating group have several yachts and a pair of cabin cruisers being observed in the pond lately.

The Efficiency trials were held in August. This was popular with some 13 entries in the event. The Graeme Baxter Memorial Trophy was awarded to the Southland club with 1656 points from the Gore club with 1533 points.

Southland Soc of Model Engineers Inc.

Location: Surrey Park, Invercargill

Public Running: ???

Maidstone NZ

Work is continuing on re-routing the elevated track to make way for the new 7.25" gauge track. Founder member Phil Davis is recording work on the alignment. Maidstone was well represented at the "Harold Sinclair" weekend at Havelock North.

Maidstone Model Engineering Soc Inc.

Location: Maidstone Park, Upper Hutt

Public Running: ???

Mangere NZ

Rides taken over the past year have increased on previous year, mainly due to Sunday running. One of the years highlights was the commencement of repayment of monies loaned by members to help finance the new clubhouse construction.

The MLS club has several new members including a group of juniors.

The Queens Birthday open weekend was a great success with visitors from all over the North Island. Considering the limited advertising we still had over 3000 passengers.

Recent working bees have split into three groups. One group commenced assembling the new trolleys. The second welded up sections of track and the third dug up tree roots that were lifting the park track.

Following weeks saw the use of the new passenger ride cars. From all reports they were safe, comfortable to ride on and the brakes worked well.

Manukau Live Steamers Inc.

Location: Mangere Central Park, Robertson Road, Mangere

Public Running: Every Sunday

Moorabbin VIC

The club's workshop has started to grow into quite a respectable affair.

The inaugural timetable run took place on 19th September and provided much enjoyment to all those who took part. The object was to complete five circuits of the elevated track within the prescribed time. The run took about 25 minutes with 10-second stops at each of nine stations. Points were awarded for early or late arrivals. Firing was not allowed at any station. To collect the least number of points was the drivers' aim.

The eventual winner was Keith Hartley. It was said that because he had the last run, he had the benefit of learning from the earlier mistakes of others. However, Keith maintains that those who drive 3 1/2" gauge locos are just better drivers!

Comments from those who attended and took part were all favourable and there were many requests to "do it again".

Club runs included an AALS Invitation Run on 22nd August with members from at least seven clubs attending.

At a recent Special General Meeting changes to the Constitution were voted in. There has been some discussion on a proposed new station near the tunnel entrance and a straw poll indicated a favourable reaction from the members.

Public running days have seen plenty of locos and good public attendance. No long queues but plenty of passengers over the afternoons.

The garden tool shed is now near complete. Development and modifying of train on track detectors continues apace.

Steam Locomotive Society of Victoria

Location: Rowans Road, Moorabbin

Public Running: 1st Sunday except Jan.

What has your club been up to?

We all like to keep in touch!

Send a brief note to tell us!

Or post a copy of your newsletter — but make sure you use a highlighter pen to show the item you would like us to publicize. Remember to concentrate on news that appeals to AME's wide range of readers.

Nelson NZ

The society continues to grow and expand its membership. In the past year there has been plenty of member participation, especially in the area of the new club building which is beginning to look very impressive. The Civic Trust has also offered a very substantial grant towards our new building.

Nelson Society of Modellers Inc.

Location: adj. Tahunanui Beach, Wakarua Rd, Tahunanui

Public Running: Every Sunday

Petone NZ

The subject of a proposed amalgamation with Maidstone has been discussed at length. The members have decided the status quo shall remain for the immediate future.

Some members attended the "Harold Sinclair" weekend at Kierunga Gardens Railway to honour the man and see eight of the locomotives he has built in action or on display.

Hutt Valley Model Engineering Soc.

Location: Marine Parade, Petone

Public Running: Every Sunday

Perth WA

Even with the club grounds closed for two months earlier in the year, the earnings for the year have hardly been affected. The Fern Road area has been given approval for re-habilitation. Recently we have been able to return to Niana for our runs.

Castlereare Miniature Railways of WA

Location: rear 100 Fern Road, Wilson

Public Running: 1st Sunday

Tauranga NZ

The fire fighting regime of the club has been looked at and a dry powder extinguisher placed in service at the clubhouse. A fire service representative has been arranged for a presentation/demonstration.

The committee has recommended to build the new clubhouse in the south eastern corner of the Mini Putt area. The local council and Rotary club have been consulted and the response so far has been good.

Tauranga Model Marine and Engineering Club

Location: Memorial Park, Tauranga

Public Running: Every Sunday

Club not listed here....?

It's on our Internet club site at <http://www.ameng.com.au/clubs.h>

Toowoomba QLD

The Toowoomba club is back on track with its railway operations again. The track is dual gauge ground level 57 1/4" with a circuit of 656 metres. We have been operating publicly again since April 1998.

We operated at the Carnival of Flowers on 19-20th September and 2000 people enjoyed the spectacle of the miniature railway. Four steamers and a "diesel" cane loco have been doing the bulk of the passenger hauling.

Toowoomba Live Steamers Inc

Location: Kearney Springs Historical Park, Spring St, Toowoomba

Public Running: 3rd Sunday

Whangarei NZ

The club is building a new 5" and 7 1/4" track in a new location — Heritage Park on Highway 14 at Maunu on the Whangarei-Dargaville Road. The aim is to have limited running by Feb '99. Contact is the Secretary, Lou Ellmers, 8 Alamein Ave, Onerahi, Whangarei 0101 NZ

Whangarei Model Engineering Club

Location: Heritage Park, Highway 14, Maunu

Public running: None at present

Morphett Vale SA

On one of our public running days in July a member of the public raised concern with the Industrial Relations Department about the closeness of trains passing our station roof support posts located along Platform No. 3

As it is not possible to shift track 3 to allow better clearance, we responded under our duty of care by restricting the length of trains to 14.5 metres. This allows No 1 and No 2 platforms to be used as trains exceeding this length would foul either of these platform tracks. We also painted the lower part of the posts white, together with instructions for the

Signalman not to use platform 3 unless unavoidable, when the driver must be advised by radio to enter the platform at LOW SPEED. One never knows who is watching our operation.

The track infringement clearance raised by the Industrial Relations Dept causes concern to the committee in relation to our Main Line track where it passes over a culvert at the 800 metre mark, as a safety girder is within the track infringement clearance. Therefore it was decided to re-align the track across the culvert to provide the adequate clearance.

With one third of the Loop Line now "T" track and plastic sleepers, track circuit signalling is possible, and a Permissive Signal has been put in place giving trains track clearance past the new shed. This now enables the medium speed restriction to be lifted and normal speed reinstated.

Our Rolling Stock Co-ordinator has been given approval to purchase automatic couplers for use on our service wagons. Also the club Way and Works loco has been equipped with headlight and cab-mounted strobe light, together with straight air brake which now allows it to haul more than two passenger cars on running days.

Life membership was awarded to Karl Hampel, our Perway Co-ordinator in recognition of the many years service he has put in.

Morphett Vale Railway Inc

Location: Wilfred Taylor Reserve, Wheat/sheaf Road, Morphett Vale

Public Running: 2nd and 4th Sundays

Warner QLD

A large new shed is now in use at Warner. It has already proved its use as a dry covered area for fabrication and welding. At a recent gathering, the need for increased subscriptions was discussed as the present fees do not fulfil the unavoidable obligations.

Eric Evans, one of the QSMEE long time members was recently honoured on his retirement from the Chair of AMBSB by being presented with a large painting of a BB18/4 locomotive. This was presented by AALS President Barry Glover on behalf of affiliated clubs Australia wide.

Qld Society of Model & Experimental Engineers Inc.

Location: Warner Road, Warner

Public running: None

Coming Events

23 January 1999

Morphett Vale Railway — SA

M.V.R. members invite you to celebrate with them 21 years of operation of the railway. BBQ and night running, visiting locos welcome. Join in for public running the following day. More info, contact John Wakefield Ph. (08) 8362 3269 Fax (08) 8362 3952

13 to 14 February

LHME invitation run — Wodonga Vic

Lake Hume Model Engineers invite you to their invitation run where the track will be officially named as Wodonga Creek Miniature Railway. Spit roast dinner on Saturday night cost \$13 per person followed by a night run.

2-5 April

AALS 43rd Convention — Edgeworth NSW

Lake Macquarie Live Steamers are hosting the 1999 Convention (see separate article on this page)

15 to 16 May

Annual Kindred Society Day — Moorabbin Vic

The Steam Locomotive Society of Victoria are once again hosting this annual event. The theme this year is Electric Trams and other Electric Locomotives, inspired by the fact that the recently serialised G E Tram originated in SLSV. Others not excluded, all comers welcome. BBQ lunch and endless tea and coffee

6 to 11 January, 2000

Model Engineers Convention — Blenheim NZ

Marlborough Associated Modellers are hosting this 2-yearly event. 2 1/2", 3 1/2" and 5" elevated and 5" and 7 1/4" ground level tracks. Boat pond with harbour complex and tethered car facilities. Further details later.

12 to 14 August 2000

IBLS Meet of the Millennium — Burnaby, B.C. Canada

Details of this event appear elsewhere in this magazine. Contact Barry Glover 31 Spinks Road, Corral NSW 2518, Fax (02) 4283 2331

AALS 43rd Annual Convention

The 1999 Convention is being hosted by Lake Macquarie Live Steam Locomotive Co-operative Society Limited located opposite the end of Velinda Street, Edgeworth, just south of Newcastle in NSW.

The club's extensive trackwork comprises 370m of 3 1/2" and 5" elevated, 925m of 5" only ground level, 975m of 7 1/4" only ground level and 600m of shared 5" and 7 1/4" ground level. A new station and a 41' tunnel are features of the 7 1/4", extra rails have been added to the 3 1/2" to allow 5" riding trucks if desired, extra steaming bays and roads in the marshalling yard.

There are easy unloading facilities for all gauges, 12 volt and air to all steaming bays, fully automatic signals on 5", hand operated signals on 7 1/4" and security round the clock. Track supervision and signalling will be provided between 7:00 and 21:00 hours. You

can run 24 hours a day if you wish, but outside these hours you are on your own and no whistles after 21:00 hours.

Boiler Certificates and proof of current **AALS Insurance** or equivalent must be produced. Non steam vehicles and rolling stock will be checked for compliance before running.

Extra attractions will be vintage farm machinery and several traders stands.

Registration forms have been sent out to all clubs. If you haven't returned yours yet, better do it soon as the various accommodation options are filling up fast.

The person to contact is the Convention Secretary, Jeff Wakeham, PO Box 200, East Maitland, 2323 or phone (02) 4933 4526

Parting off Urethane and Rubber

by Alby Smith

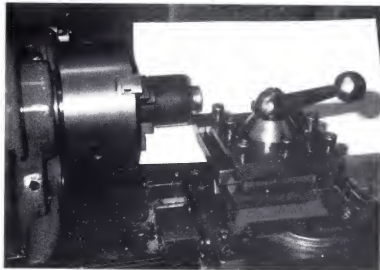
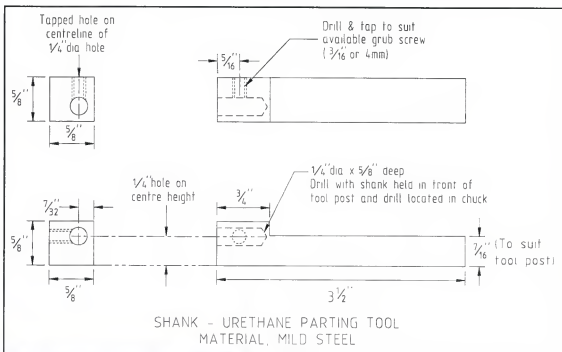
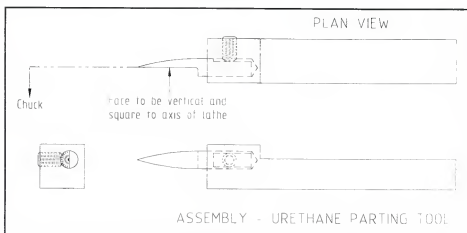
Photos by the author, drawings for publication by Jim Gray

The usual options when making a gasket from say, Polyurethane Elastomer (commonly referred to as "Urethane") or rubber is to obtain material of a suitable thickness then proceed to cut the inner and outer diameters with wad punches or get to work with a knife and a pair of scissors. The latter method is often resorted to because of "Murphy's Law" which states: "The right size punches are not at hand".

Recently I visited a mate of mine who owns a company specialising in Polyurethane Elastomers. This mate, Ken, asked whether I could help him out by machining the OD and ends on a quantity of rollers. These rollers consisted of a steel core machined through the centre and counter bored each end to accept sealed races. The outside of the steel section was coated with a relatively soft (70 Duro hardness) grade of Urethane about $\frac{1}{2}$ inch thick.

Examining one of the rollers I noticed the Urethane was longer than the steel centre indicating the material (because of low volume) had been cast using standard toolage. Aware that soft grades of urethane were near impossible to machine because of *cut resistance* I said to Ken, "I think I will give it a miss because I will end up in more strife than Ned Kelly". "Just a minute."

Below: the tool is in the lathe and a cut has been started

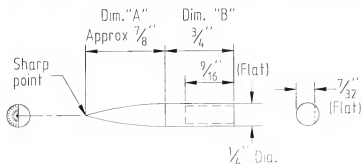


Kenny retorted, and away he went, eventually returning with a pipeline gasket about 10" dia with 4" bore and $\frac{1}{16}$ " thick. Upon examination, the gasket appeared to be about 80 Duro A (ie. very flexible) and exhibited faint machining marks on both faces. I thought

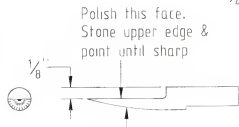
the machining marks resulted from the mould. I was astounded when told the discs had been parted off in the lathe.

We then visited the machine shop where I was shown a parting tool of the like I had never seen before. Leaving the factory with 60 rollers in a box and with Ken's parting words ringing in my ears, "don't forget to use coolant and give the turning tool heaps of rake", I found that "heaps" is about 15-20 deg both side and back.

Arriving home, I proceeded to make one of these special parting off tools to suit the Myford 4-way tool post. (Refer accompanying sketches). To gain experience (was Ken having me on?) the decision was made to test the tool on a piece of Urethane tubing: $1\frac{3}{8}$ " OD x $1\frac{3}{16}$ " ID with a hardness of 80 Duro A



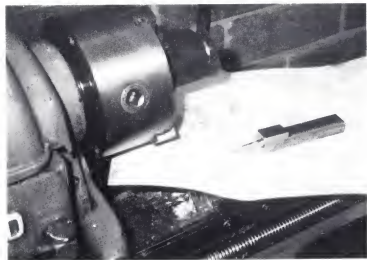
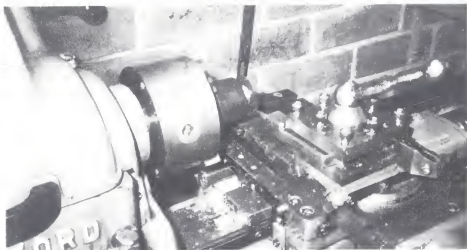
Dimensions "A" & "B" are suitable for materials up to $1\frac{3}{4}$ " dia. Increase "A" & "B" for larger diameters



Material: Silver Steel
Heat front radiused section to 800°C (cherry red), then quench in oil using a stirring action

Approx. $1\frac{3}{4}$ " radius, refer Dim "A"
Turn in steps, file to shape.
Polish with emery cloth.
Minimum radius in corners - $\frac{1}{32}$ "

CUTTER - URETHANE PARTING TOOL



Two further views of the completed tool and a cut being made on the author's lathe. The lower view shows the well designed tool holder.

With a short length fitted to a stub mandrel spinning at 635 revs/min the tool was plunged in while applying coolant. To my amazement the

tool worked like a dream.

Play time! How thin could the washers be made? Using the top slide divisions for reference, washers .010" thick were parted off easily. With new found confidence the rollers were attacked and before long the job was finished. Apparently, this type of tool can be used for parting off rubber.

Manufacture of the tool is fairly straightforward. Hopefully, the attached sketches and photographs will provide all the information necessary.

I asked Ken whether I could tell the world via the pages of AME about this 'magic' tool. No worries, but how about giving the company a bit of a plug? So with the editor's permission:

Mr. Ken Worthing, Director.
Engineering Plastics Pty., Ltd.,
43-45 Triholm Avenue,
Laverton Vic 3028
(03)9369 2577

Specialises in Polyurethane Elastomers and other engineering plastics. Urethane sheet, rod and tubing in a range of sizes and hardness; ex stock. Production and proto type work including copying from rubber samples. Example: Petrol tank knee pads complete with detail as used on classic motor cycles. Because of shrinkage, the Urethane reproductions are smaller when using original parts as patterns. (Shrinkage; <1% on most grades of urethane).

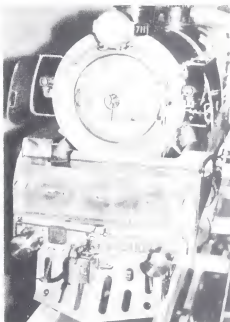
Melbourne's 4th Model Engineering Exhibition

A story in pictures by David Proctor

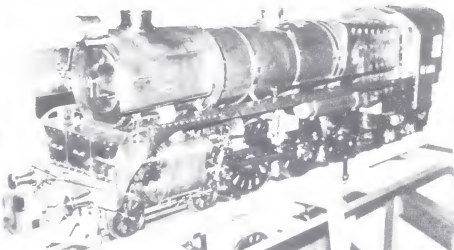
What a great show! And such a huge diversity of models too! The 4th Model Engineering Exhibition hosted by the Melbourne Society of Model & Experimental Engineers was a credit to all who participated. Numbers through the door were down a little on the previous exhibition, but the Saturday was federal election day and Sunday was the time of the Grand Prix at Phillip Island. A bit hard to avoid when you have to book a venue 13 months ahead. From an exhibitor's point of view, I didn't mind too much. The sheer range of what was on show and the camaraderie all round made up for anything. Rather than bore you with words, here is a visual impression of what you missed!



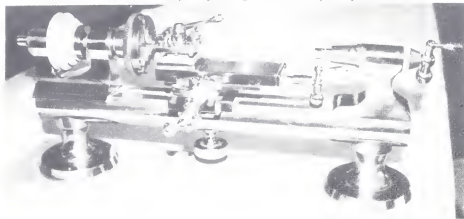
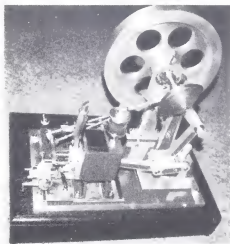
Kurrajong is a 1/24th scale model built by Ray Adams of Sydney and based on a fishing trawler from Foster NSW. It is entirely scratch built and still has some detailing work to be done

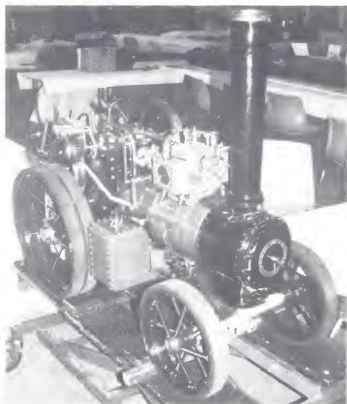
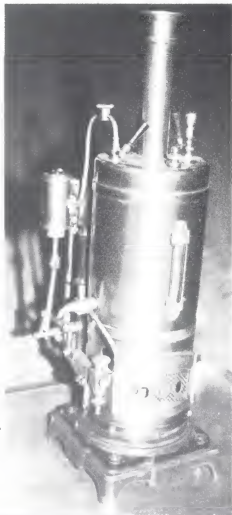
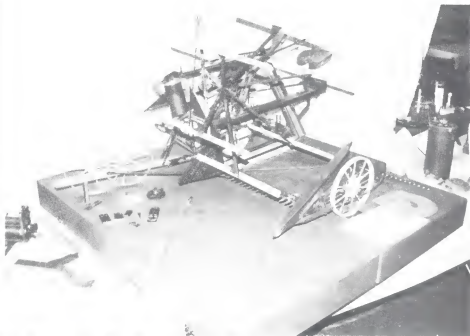


Above: Another shot of Warren Williams' 'R' class. Below: Atkinson Cycle petrol engine by Bryant Albinson of MSME.

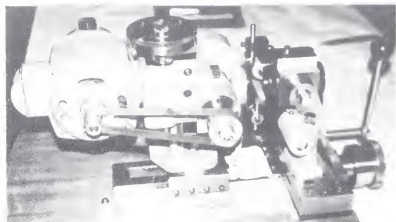
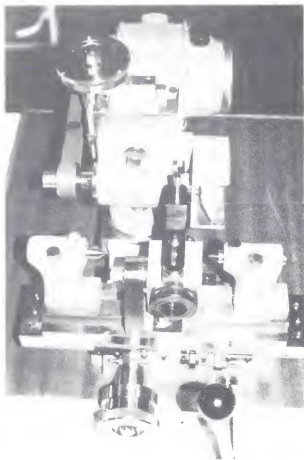


Above: On the Tullamarine club stand is Warren Williams' magnificently detailed 5" VR 'R' class loco. Below: Glen Bryant of Bendigo made this exquisite jewellers lathe.



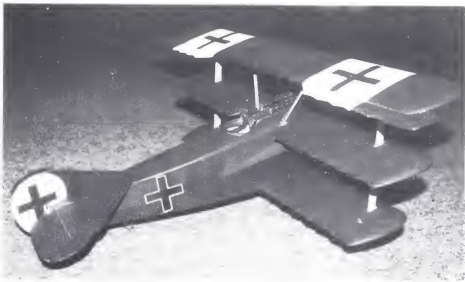


*Clockwise from above:
Alan Williams' 1/4 scale
Massey Harris binder
(Canadian c.1900), a
century old vertical boiler
restored by Frank Birchall,
two views of Alby Smith's
superb Stent tool & cutter
grinder and a Ransom,
Sims & Jeffries 1927
traction engine in 4" scale
by Doug Black.*

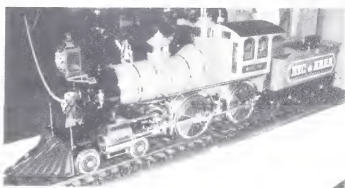
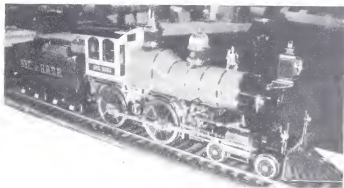




Above: This beautiful model of HMAS Huon, one of a group built by Leigh Adams from Sydney, has featured in AME before. Below: This Fokker Triplane was sitting on the MSMEE stand, but the Red Baron was nowhere to be seen!



A pair of NYC & HRRR 4-4-0 American locos (below) built by Bill Steward of SLSV. If you look closely, you can see there are detail differences between the two models



A female viewpoint

The big day of the MSMEE exhibition arrived and people from all walks of life came through the doors. The work on display appeared to me to be very fine work. Skilled people were everywhere with their boats, locomotives, stationery engines, gliders, pumps, drills and all types of interesting models.

The locomotives that took my eye were the 4-4-0 American NYC & HRRR pair, built together over 11 years by Bill Steward from the Moorabbin club. The full size prototype was first built by John Buchanan in 1877.

My friend Stan McKeown set up a display on the life of LBSC. There were many books and photos about his life. LBSC's locomotive designs were represented by Stan's *Evening Star*, Roy Trotter's *Britannia* and a 2½" *Fayette* built by Jack Harper. LBSC also designed many others, many with girls names.

Stan also had his 7¼" freelance 3-cylinder chassis and steel boiler. The boiler is a steel wet back with copper tubes.

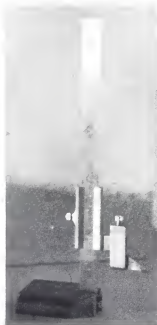
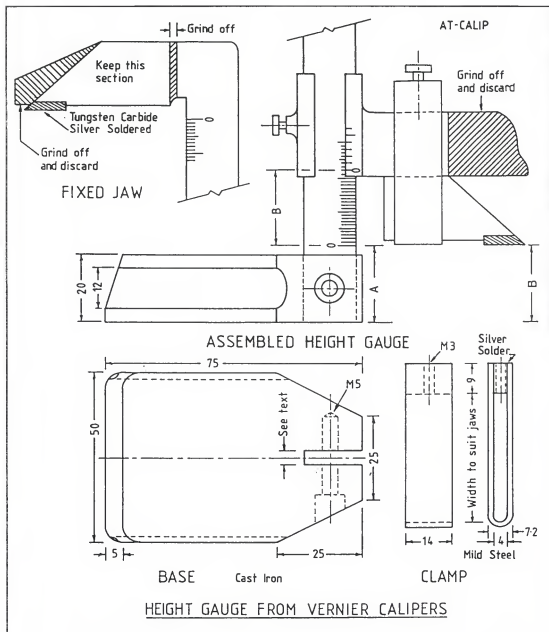
The exhibition was a great success

Helen Hotchin

Height Gauge From Vernier Callipers

by Arnold Thuys

Drawing for publication by Peter Hall




The author's completed height gauge ready for use. Photo: A Thuys

3. The vernier used was for RH operation, so the "concession" has to be made to use it as a LH height gauge — not a great cost.

4. Make sure that the distance "A" is larger than the thickness of the cast iron base and that the sliding jaw does not hit the top of the base. Arrange for the "zero" of the upright to be in such a position that the Vernier reads a little above zero, while the bottom of the tungsten carbide tip just touches the surface plate. Only then grind the bottom of the tungsten carbide until the zeros coincide.

side, (Distances "B" are then identical)

5. The 4mm slot in the base in my case gave a very tight fit for the upright but there will be of course individual differences — so check the thickness first. 

I have surrendered to the convenience of direct-readout vernier callipers for some time now, but having grown up during the 40s and 50s was of course unable to just scrap a good quality European calliper in its purple velvet lined case. It sat in a drawer for years until some 12 months ago when I decided to convert it into a height gauge to be used for marking out on the surface plate.

As some readers may be in a similar position, I submit some sketches and a few comments on my experience.

1. The fixed jaw of the callipers was cut off as indicated and shaped (by grinding as the stainless steel was extremely hard) as

shown and a piece of tungsten carbide was silver-soldered in position. Final grinding of the tungsten carbide tip was left until the unit was finished.

2. The 5mm dia hole in the 250mm upright was done on someone's spark eroder (at some cost) as the stuff was impossible to drill. Its position was accurately measured afterwards and then marked out on the east iron base before that hole was drilled and tapped. (Does anyone know how to make a light duty spark eroder? Sometimes an 8 or 10 BA tap breaks!)

Check your records....

The mailing address for AME is:

**PO Box 21
Higgins ACT 2615**

Drowning Blowflies in Wollongong!

The 1998 Blowfly Rally and Wollongong's Big Wet

by Ross Edmondson.

Photos by the author unless otherwise indicated

Over the weekend of the 8 and 9 August the sixth annual Blowfly Rally was to be held for the first time outside of Mudgee, the hosts being the Illawarra Live Steamers. The lead up to this prestigious event involved many hours work behind the scenes to ensure that everything would go ahead as planned.

ILS club secretary, Warwick Aston, made a special trip out to Mudgee prior to the event in order to get the "Mudgee Mule" as one of the proposed events to go with the "Blowfly Shunt" and also the "Blowfly Flyshunt". Prior to the rally, John Oliver, former Mudgee secretary was contacted and the wheels set in motion for the printing of certificates for the winners of the respective events, as well as one for the Most Popular Blowfly. The ladies had the catering arrangements well in hand and made sure that everyone knew what was going on.

The grounds were tidied, lawns mowed and everything looked spic and span. The one thing that we did not take into consideration was the weather. Tuesday was overcast, Wednesday it rained, Thursday it poured, and around lunch time Friday former livewire secretary of Mudgee, John Oliver was the first visitor through the gate, towing a caravan for the first (and last) time. With raincoats on he was manoeuvred into a position adjacent to South Box and power supplied whilst the



The deserted tracks say it all as brothers Bernd and Rob Sensche enter the ILS yard

heavens opened up. Next to arrive was Lindsay Pratt (from the Tullamarine Society) who had decided to camp on site in his van but as the weather worsened he opted for the warmth and comfort of a nearby motel.

After viewing the local news and weather on telly, around 7 pm John decided to have a look around the caravan, stepping out into 6" of water. The appropriate "panic" button was activated with the end result the van was re-tethered to the car and headed for home! No doubt with fond memories of Wollongong?

Saturday dawned and it was still raining. With the telephone running hot many visitors were advised to "stay home" as the road conditions were most unfavourable. On site there were about 18 club members who kept Lindsay Pratt company but as the conditions deteriorated numbers dwindled down to around 12. There was an influx of visitors as Cec Appelbee and Jim Leitch from the Wagga Wagga Society arrived, followed by Bernd and Rod Sensche from Victoria who had managed to pick up Martin Dettler from Nowra along the way. These two from Victoria had a bit of go in them and it wasn't long before they had the first Blowfly in steam. Appropriately attired in wet weather gear they were the first on the track and soon burning up the miles. Next up was Lindsay Pratt followed by fellow club member Bert Bruce. A grand total of 3 Blowflys for the event! What a bumper! The ladies provided lunch for the multitude which was devoured with gusto.



Bernd Sensche receives the Most Popular Blowfly Award from club president Ross Edmondson Photo: Rob Sensche



A trio of Blowflys seeking refuge from the elements at Mt Pleasant Station Photo: Sensche



The high tide mark on the door of the all-electronic North Signal Box indicates the water level reached

In order to make something out of nothing there was a unanimous decision by those present to award the Most Popular Blowfly Award to Bernd Sensche of the Springvale Society who was somewhat surprised by it all. Many thanks to those who did turn up and make the day a success (?) and to those who showed better judgement and stayed at home well, I've been told there's better days ahead. The 1999 Blowfly Rally will be hosted by the Orange society and in 2000 it will be back home in Mudgee. And as for the Awards for the events which were not held at the I.L.S. well, we'll keep them for a "rainy day"....

Wollongong's big wet

Over the weekend of the 15 and 16 August it rained in Wollongong. So what? It rains everywhere! Well, in just 24 hours we had 100mm, or to us old-timers, 4" of rain with another 9mm on Sunday afternoon — just enough to put you off mowing the lawn.



This tank doesn't hold water...but there's plenty on the ground in the yard



An electric point motor. The cover was located in the bush

Needless to say it played havoc with the traffic in Wollongong and also the low lying areas around the district, but little did we know what was in store for us on the following day!

From midnight on Sunday to midnight on Monday that there was approximately 850mm of rain fell in Wollongong in that 24 hour period. According to the experts during 1997 the total rainfall was 977.2mm and to achieve this amount in three days, well, there's no need to elaborate on how the low lying areas around Wollongong were effected.

The many visitors who have visited the Illawarra Live Steamers piece of hallowed turf at North Wollongong will know that the western side of the grounds is bounded by Fairy Creek, a natural water course from the suburbs of North Wollongong, Keiraville and Mt. Keira which flows out to the Pacific Ocean. However, to the uninitiated there is another arm to this creek.

off to the north where the rainfall from the Balgownie and Mt. Pleasant areas also flows and they both meet approximately 150 metres from our canteen! With all this rain it's got to go somewhere and by now you would have guessed it. The end result was that the I.L.S. was approximately 4ft or 1.2m under water. Just for the record the following areas had the following amount of flood water through them: South Signal Box 4' 10" or 1475mm, North Signal Box 4' 8" or 1420mm, Mt. Pleasant Station and our No.2 shed both had 3' 3" or 990mm. Everything went under — the lawn mowers, the air compressor, the buckets of crushed char were full (of water) the new bag of cement can

now be used as a door stop, the pinboard doors in the Canteen outgrew themselves and have since been replaced and the photos might give some indication as to what we had to contend with over the next few days.

Needless to say the track held up remarkably well — admittedly there was some ballast washed out in places but the biggest problem was the mud, muck and rubbish collected in and around the points which had to be dealt with individually. It should also be noted that the ballast now has a coating of mud all over it, but I have been told don't despair, there's better days ahead...?

On the home front several members had minor flooding through their garages and workshops, just enough to be a nuisance and from all reports there was only one club member who got water through his house. At the height of the storm he opened the front door to see the flood water at the top step and his new Ford Fairmont floating out of the carport and down the street. It is pleasing to report that sanity prevailed as he shut the front door and went back inside! The car was located the next day three houses up the street and has since been written off.

On behalf of the Members, I would like to thank the many people who had telephoned myself and Warwick Aston, and offered help and assistance in the clean up campaign.



Adjacent to the western siding... 3 weeks later it was still there.

1999 Entry Form

Name Age

Address

..... Phone

Club or Society (if applicable)

Qualifications and/or occupation

Brief description of entry

Approx. dimensions & weight (Enclose photo if possible)

Equipment used in construction (e.g. lathe, drill press, hand tools etc.)

Other information relating to the entry (eg. outline of construction and assistance had, if any)

Australian Model Engineering undertakes that the privacy of entrants will be respected.

I hereby declare that:

1. I have personally constructed at least 75% of my entry.
2. I was under 25 years of age as at 31st December 1998.
3. I agree to the conditions of entry and that the judges decision will be final.
4. I agree to display the entry at the 1999 AALS convention site for the purposes of judging.

Signature Date

The AME Under 25s Encouragement Award

Conditions of Entry

Younger model engineers are making great contribution to the hobby, even though they are often hampered by having less access to tools and resources than older model engineers. AME instigated this award in 1993 to encourage under 25s to show their talents; to engender a spirit of encouragement in more experienced model engineers; and in a small way to foster the growth of participation by people in the younger age range.

We've been pleased to hear that a number of under-25s have been spurred on to complete their models by the thought of participating in the award.

If you fit the age criteria, photocopy the entry form on the next page, post or fax it to AME and start a-fittin' and a-turnin'!

Age criteria

If you turn 25 in the 1999 calendar year or later, you are eligible. If you turned 25 in the 1998 calendar year or earlier you are not eligible.

Entries

May be any model or experimental engineering item or model. For example it can be

a steam, diesel or electric outline locomotive; steam, internal combustion, electric, hot air and Stirling cycle, stationary or mobile plant or road vehicles; boats or ships with any form of power drive; marine plant; workshop equipment, jigs, fixtures and aids to manufacture; clocks and other horological or astronomical items; electronic, programmable logic, digital and analogue controls and monitoring of any of the above models — or any other item(s) which the judges consider relevant to model engineering.

Judging

The following is taken into consideration:

- The age of the entrant and skills relevant to age.
- The ambitiousness of the project.
- The workmanship of the project.
- The access to workshop facilities.
- The location to resources and materials.
- The formal skills of the entrant.

The above is intended to even out the playing field so that the judges may look at

each entry "all things considered." The idea is that the thirteen year old student (with no formal mechanical skills) from the Back'O'Bourke who works in a tin shed with pistol drill, hacksaw, file and hand scraper to build a model of a ferris wheel has as much chance as the 25-year-old qualified thou-splitting toolmaker with a CNC workshop and limitless resources who has turned out a VR H class 4-8-4 with working stoker engine!

Have a go!

The presentation will take place at the AALS convention at Edgeworth this coming Easter. Entries will be received up to day one of the convention. The perpetual trophy will be awarded at the AALS presentation night on Sunday evening. A prize (to keep) relevant to the winner's interest in the hobby will also be presented.

So come on all you younger model engineers, let's see the tables with plenty of entries on them in Edgeworth this Easter!



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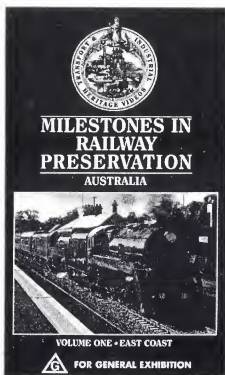
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January-February 1999

Product Reviews



Milestones in Railway Preservation

Volume One — East Coast

This video comes from a newcomer to the Australian scene and is marketed as the first of a series of videos depicting the preservation and returning to service of steam locomotives across the continent. This first video covers the eastern states, namely Victoria, NSW and Queensland.

The first scene depicts the running gear of Victorian Railways R761, the engine slipping on the wet rail in a loco depot. Next we see some rusting hulks in various depots and museums and then several shots of restored R766 (circa 1985) on a special train galloping through the Victorian countryside. All through this we are treated to a funeral trumpet lament and I was thinking "Oh no! Not another boring hodge podge of stills and arty shots" (rain dripping off running boards) so common to many Australian productions.

However, it quickly got better. The video begins in earnest with contemporary big diesels on long trains and XPTs crossing, with the smooth (and unobtrusive) voice of Bob Hughes summarising the changes in rail travel, motive power and the focus of modern rail business. The early demise of the big en-

gines in NSW is touched on, some time honoured footage of triple headers struggling out of Lithgow, (in black and white) and the 57 and 58 classes at work. The film is overlaid with a soundtrack of the big engines, with their distinctive triple beat exhaust.

There is extensive coverage of the Queensland Railways A10 class No 6 restoration and subsequent running, including some spectacular shots on the Kuranda line, in from Cairns. Also shown is a preserved PB and the recently restored QR Garratt 1009. A look at the Zig Zag railway in NSW shows us more QR locomotion, with their BB18½ doing the honours on an ascent of the famous zig zag. An extended coverage of NSW 5910 on tour and double 35 class and an AD60 are also covered. A quick look at the 32s, 35s and 38s but the big pacifics are covered in depth later in the video.

Victorian D3, K and J class are given some space and extended footage of the restoration of R766 and a set of carriages earmarked for the ill fated luxury private train which ran in Victoria for 12 months in the mid 1980s. There are some excellent workshop sequences of 766 under restoration. All three restored VR R class are taped and there is some splendid footage of them working at speed with the Geelong and Bendigo passenger trains.

There are some excellent night shots of R761 arriving at Bendigo and in the loco depot being turned, but the remaining night shots are best forgotten as they mostly show a bright light (the headlight) moving across the black TV screen. However, the sounds of steam at night are at their best. One sequence on the Geelong passenger I found curious — an R at speed on the passenger coming towards the camera from the distance. Just as it starts to get interesting the scene is cut (what an anti climax!) to a zoomed out shot at the same location. However, this one is allowed to develop and R766 races past and we are left with a trailing shot of speed and power at its best!

The NSW 38s are covered in detail with archival footage of many famous "last runs" with various combinations of the class. One scene which brought back memories was not so much the scene of 3820 leading 3830 on the north shore line but the distinctive broken note high-low chime whistle of 3820 which all the class seemed to have in their early years.

Back to the video, the restoration of 3801 is touched on and the re-building of 3830 is covered in very long visual and descriptive sequences. Again there are some excellent workshop takes. However, I felt the 3830 restoration clips could have been trimmed somewhat as it did seem to drag on a bit. The video is rounded off (from my point of view) with some excellent footage of 3830 and 3801 lifting a tour train away from a station on the north and later attacking the famous Cowan bank in great style.

The video runs for approximately 90 minutes. Maybe a bit of fine tuning with the editors scissors could have made it 75 minutes full of interest. The older footage quality reflects the photographic equipment that was around in the fifties and sixties but it's good for the nostalgia and historical content. The contemporary sequences are very good video quality, as is the sound. Again, Bob Hughes' narrative is excellent.

I have given this video a bit of a pasting in parts. However, in my opinion, it is the best Australian production I have seen so far. In fact I feel it is better than most overseas productions I have viewed as well.

Milestones in Preservation

Vol. One — East Coast

Price: \$54.95 incl. p&ph Australia wide

Available from: AME Retail, PO Box 355 Koorling NSW 2650 or ph/fax, orders to (02) 6926-4554.

Also available across the counter from ARHS Sydney and Brisbane and the Railfan Shop in Melbourne.

Neil Graham

The 57's and 58's

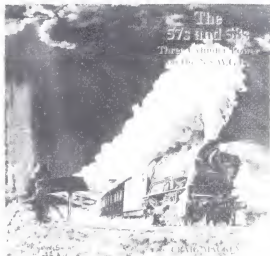
Three Cylinder Power on the NSWGR

by Craig Mackey,

Published by the New South Wales Rail Transport Museum.

224 large format (277mm by 296mm) glossy pages, hardcover with dust cover mostly black and white with some diagrams and colour reproductions.

From a review of the New South Wales locomotive fleet before 1925, through the Fay-Raven Royal Commission, the course



was set for a 3-cylinder engine. Craig Mackey takes us to the United States. He reviews 3-cylinder power on the railroads that were experimenting with it (this making a fascinating comparison with what eventually developed), and then returns home to review the locomotive policies in South Australia and Victoria. Craig then explains the design philosophy that went into each of the main components of the 57 class before he takes us on a fact finding journey with Bill Slater, a Steam Shed Inspector, who with others, went to the United States and Canada to sample big engine operation first hand. Then follows a detailed story of the 57s' introduction into service, and the trials and tribulations that they encountered. There are plenty of statistics of running times, operating loads, and boiler tests. The engine shortages that were felt during the war and the attempts to relieve them which eventually resulted in the 58 class are described. A reprinted part of Ken Grove's book *The Big Engines* is included to give the reader a driver's view of the big engines on the road. The book concludes with their eventual demise, initially through electrification over the mountains, and then the onward march of dieselisation.

Even though the author's notes specifically exclude the politics that evolved around the engines, I would have liked to have seen some greater mention of the public investigations that followed the 57 class rod breakages, and early failures. These public events would give a better picture of the pressures that were on the Mechanical Branch at the time. Also missing is a drawing of the rack and pinion centre cylinder valve gear. This mysterious device shrouded behind its cover plate still remains an enigma to most of us despite some photographic coverage. How enticing it would have been to be able to see the actual device in operation!

A few drawings are provided, the various blast nozzle shapes being an excellent example of a drawing being worth a thousand words. The description, no matter how good, would be difficult to describe the subtle variations. Drawings of the axleboxes and big end arrangements would have been useful additions as well as a fold-out general arrangement in better quality than the photographic reproduction that had to be accommodated within the book's size. There are numerous sketches of the various outline configurations which help place the big engines in context. I would have liked to have seen more technical detail drawings, but perhaps this is somewhat compensated for by some excellent work's photos of various components such as the boiler plates, and cylinders and running gear.

The 57s were, by one who never knew them, a mystery, with most considerations of them punctuated with the problems with the coupling rods, steaming and the 58's coming out much later to an almost identical design with additional defects! This book dispels the myths. It takes you on a journey from the conception of the design through the investi-

gations, both here and overseas, the construction and then the trials and their entering into service. I suppose by its nature it deals with the failures, and this would upset the balanced view of the locos, which by and large were well respected and masters of their task.

The 58's were quite a different machine, similar in size and parentage, but different in many essential details done to improve route availability and reliability without unduly suffering significant reduction in power.

The result was two classes of engines that looked very similar, but were totally different in the ways they needed to be handled to produce results. It took time for the crews to learn the new ways (probably some never did) and undoubtedly led to many of the myths that sprung up around these engines.

There has been a tendency on the RTM produced loco books to provide paintings on the dustjackets. Steam locomotives are difficult subjects for an artist made even more difficult by a critical audience. Phil Belbin obviously mastered the subjects. In my view, post Belbin, the later books have not managed to maintain such a high standard.

The printing and photographic reproduction, including the colour photographs, is excellent. The large format book makes for plenty of information without resorting to that smaller font size that becomes difficult to read. The large page size does, however, make it a bit difficult to read in bed!

Some earlier books suffered from an irregular, often haphazard, arrangement of technical detail. In many cases an enticing piece of technical trivia was left hanging without explanation. Here, Craig Mackey has carefully provided the design concepts, their good points and their bad points and the consequential variations which subsequently occurred with the reasons properly explained. There is obviously a lot of work and research that has gone into this to avoid the more simplistic 'listing' of unexplained technical items and the book is all the more valuable for it.

Without doubt, this book is an essential addition for the NSW locomotive student's library.

The 57s and 58s

Three Cylinder Power on the N.S.W.G.K.

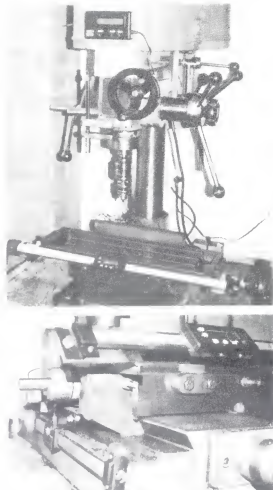
Price: \$54.95 (incl. p & p Aust. wide)

Available from: AME Retail, PO Box 355 Kooringal NSW 2650. Ph/Fax orders to (02) 6926 4554

Warwick Allison

HAFCO Digital Indicators

When approached by the editor to test this piece of equipment I jumped at the chance because, as the owner of a very early Taiwan-



ese mill drill, I had for a long time been looking for a suitable form of digital indicator system.

Two digital scales were supplied by Hare & Forbes, one small unit for the transverse table movement together with a large scale counter and one for the longitudinal table movement. These both came boxed, the longitudinal readout in a nice wooden box, the transverse digital readout and counter in substantial cardboard boxes. As both these units are manufactured in China, the fitting instructions and general operating procedures lost some of their meaning in the translation from Chinese to English. This is a fault common to a number of Asian products but with careful reading, these problems were overcome.

Mounting of the unit on the mill drill did not present any problems and was completed in a couple of hours. I had to fabricate two brackets to mount the longitudinal indicator and care had to be taken to accurately align the units so as not to put any strain on them over the full movement of the table and this I found quite easy to do with a little patience.

Both these units can best be described as being the same style as the now familiar digital read out verniers, but without the jaws used for measuring. They can be read in either inches or millimetres and have a zero button and automatic cut-off. The transverse movement indicator is mounted in a position which is rather hard, if not impossible to read, and to overcome this problem a larger read

out unit is supplied, plugged in and then mounted in a convenient position on the machine by means of a magnetic rear panel.

In operation, the indicator turns what can be best described as a very ordinary machine with plenty of back lash in any direction of the milling table, into a very accurate unit, still with the back lash, but now with a very accurate means of measuring table movement in any direction.

No more counting how many turns of the hand wheel, or should I say, forgetting how many turns you made last time. One job that came to mind — if have you ever had to drill a hole for a dummy rivet, in say a tender, you will know that one too many turns of the wheel can ruin the job in one foul swoop! But now with the digital indicators fitted, you can determine the distance between the rivet hole centres, drill your first hole, move the table the required distance in either millimetre or inches, drill the next hole, zero the indicator, move the table the required distance and drill the next hole, etc. What you will have is a set of rivet holes within 0.001" accuracy.

I found the unit very easy to use with only one small problem and that is that the large transverse readout is very dull unless read at direct line of sight. This was overcome by mounting the unit on a swivel bracket for different viewing or working positions.

Specifications (as tested):

Measuring range :

transverse 0- 500mm / 0-20 inches
longitudinal 0-999.99 / 39 inches

Display accuracy 0.01mm / 0.001"

Power supply 1.5V button cell

HAFCO Digital readouts

Price: (package as tested): \$399 (incl. tax)

Scales are also available in lengths to suit other machines: 200mm, 500mm, 800mm, 1000mm (prices as in HAFCO adverts).

Available from : Hare & Forbes Pty Ltd, 180 George St, Parramatta NSW 2150 (02) 9633 4099 and 550 Kessels Road, MacGregor Qld 4109. Ph (07) 3849 1888

John Oliver

HAFCO Electronic Digital Calliper

Hare & Forbes have a new 6" digital calliper in their range of products. After having

put this product through its paces, I reckon they have made a smart move.

The calliper has a large, easy-to-read screen and an auto on/off function. When the LCD displays "0", power to the battery is cut automatically after 7 minutes. The moment you move the slider or touch the button, power comes back on. Another feature which I found useful was the ability to reset to "0" in any position at the touch of a button. These features would turn it into an excellent depth gauge when fitted to a mill/drill.

The data output socket on top of the read-out housing brings other uses to mind besides being a calliper or a depth gauge. Having recently seen the HAFCO Digital Indicators reviewed elsewhere by John Oliver, I immediately recognised the output socket as being identical to those on them. Further investigation showed that the same digital counter could be plugged into the calliper, which means that it could be used in conjunction with the Digital Indicators to provide a third axis.

One very early observation I made upon removing this calliper from its well made wooden box was how comfortable it was in the hand and how everything was in the right place. This may not be very important to many people but would be of benefit to anyone slightly arthritic or manually impaired.

Some details — LCD display operated by a 1.5V silver oxide battery (stated to give one year of continuous use, with a flashing low battery warning). Auto on/off as mentioned, data output which can interface with computer or other readout device, display in mm/in (0.01/0.0005").

Checked against a micrometer it showed a very high level of accuracy, and compared against a more expensive Mitutoyo, the readings were identical.

In the past, I have tended to avoid digital callipers, feeling more confident and familiar with the traditional "steam driven" type. That has changed. Now that I have one of these little beauties, my old calliper is enjoying a well-earned retirement!

HAFCO Electronic Digital Caliper

Price: \$99.00

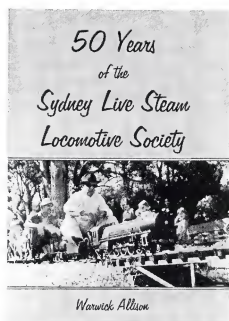
Available from : Hare & Forbes Pty Ltd (details as above)

David Proctor

50 Years of the Sydney Live Steam Locomotive Society

This 44 page book written by Warwick Allison and published by The Sydney Live Steam Locomotive Society covering the 50 years of the Society (1948-1998), is an interesting chronicle of its achievements.

Published in A4 format on quality glossy paper (48 pages), it contains a complete history of the Society from its inauguration in July 1948 up to the



present time, with over 36 black and white photos, track diagrams and a comprehensive list of members and their locos throughout that period.

The Society, being one of the oldest in Australia, has been a leader in the formation of standards for the live steam railway hobby, two being the AALS Wheel Standard and the formation of the A.M.B.S.C. Boiler Code. As you read through this book many names from the past are remembered and their contributions to the live steam hobby can be realised.

It is written in a very 'easy to read' format and contains 14 sections covering all aspects of the Society's activities and personalities from its inception and is the first book I have read that gives you an insight to the inner workings of a live steam railway society.

Whilst I am not a member of the society and have only made one or two brief visits to the site, I found this book interesting in that some time ago I purchased one of the fine locos made by Reg Woods which bears boiler code number NA68-2, the second engine in Australia, I believe, to bear the AMBS boiler code and one of 142 engines listed in the Society's register at the rear of the book.

At a cost of \$9.00, this publication is well worth buying and for anybody with an interest in the history of the Sydney Live Steam Locomotive Society, or just how things have evolved in the hobby throughout the years, it's a good addition to your book shelf.

50 Years of the Sydney live Steam Locomotive Society

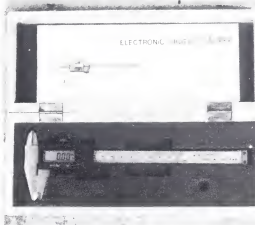
by Warwick Allison

Price: \$9.00

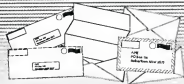
(Limited quantity available, so don't delay if you want one)

Available from: AME Retail, Camden Books, Hobbyco, E & J Winter, Bergs Hobies, EMCO, and ARHS Sydney

John Oliver



Letter Box



Motor speed controllers and lights

Sir,

I notice in the Letter Box of the Sept-Oct issue of AME, a letter from P W Grist of South Australia and that he was going to use a pulse width modulation type controller for the control of the motor speed of his milling machine table Y axis.

A 12V speed controller is already available in kit form from either Dick Smith or Jaycar Electronics, working on a pulse width system, capable of handling up to 20 Amps. I am already under way in constructing a drive for my own mill/drill machine table utilising a two-speed wiper motor from a Nissan. By making use of the two-speed system, it will give me a very large speed spread in both forward and reverse, utilising a double pole throw switch for the fwd and rev. Switching, and a single pole double throw switch for the two-speed side of things. All this is fed through a right angle drive with a reduction of eleven to one, which I figure will give me quite a spread when taken along with the variable speed control. Incidentally, wiper motors develop about half a horsepower, so don't get fingers or anything else mixed up in the works or you may regret it.

The kit number is K.C.5225 from Jaycar Electronics and is K3072 from Dick Smith. It may be necessary to buy an additional mosfet to increase the current handling side of things. I modified my kit by fitting a linear control pot in place of the trim pot supplied so that I can vary the speed whenever I want to with ease. I have done away with battery usage and will run a rectified transformer with a large smoothing capacitor across the two leads after the bridge rectifier. Don't forget to connect it up the right way around. Insertion of a small greencap capacitor reduces ripple from the regulated side of the bridge rectifier to almost pure DC across the two leads before the controller — when viewed with an oscilloscope this ripple reduction is quite noticeable. A ready made source of a power transformer would possibly be a battery charger of six to ten Amp capacity, but would need the output side to be smoothed out as described. Whatever you do, do not touch the leads of the large capacitor if it has been powered up and not discharged. I have seen a large one of these send a technician across a workshop and under a bench for his trouble. If in doubt, don't. Give the job to a professional.

Also of benefit to some of us is the low voltage 55 watt halogen light kit from Jaycar. It fits really easily up in the hole in the casting under the head of the RF 20/25/30 milling machines and comes complete with its own prewired transformer, completely sealed, apart from the 12 volt AC terminals, ready to plug in. A small hole drilled in the rim of the globe holder and a similar one in the casting lip under the mill, a $\frac{3}{16}$ bolt and nut and there you are — too easy! The bolt is only there for security to prevent vibration from causing the light fitting to possibly fall out.

Bruce Grice

Tasmania

Battery chargers

Sir,

In reply to David Mottram's enquiry on parallel charging of lead-acid batteries (AME Issue 80, page 55), it can be done but there are problems. It is possible someone will say they do/have done it successfully — "no problems"

David Mottram's enquiry does not give enough information for a full answer but a short dissertation might help. Assuming batteries of equal capacity (Amp/hrs), near new condition and holding equal charges, the main problem over a period of charge/discharge cycles is that they should continue to give equal currents on load and take in equal currents on charge. The internal resistance of the batteries

tends to change unequally over time with resultant loss of capacity and shortened life from various causes.

To assist in off-setting this likelihood, the leads connecting the batteries together should be the same size cable and of the same length (see diagram).

Also, if battery clips are used, use heavy duty type and wriggle the clip(s), when connecting, to get maximum bite.

Commenting on batteries (12V) in generally reasonable condition:

- a fully charged battery at rest should be about 12.5 - 12.6 volts.
- a battery on float (indefinite) charge should be at about 13.8 - 14.0 volts.
- a battery that has been on heavy load should be recharged as soon as possible (say later the same day) to limit 'sulphating'.

An ideal charge cycle would be to charge heavily to start, say $\frac{1}{10}$ of the Amp/hr capacity, then continue at a decreasing rate until the battery reaches 14.5 volts, then float 'indefinitely' at say 13.8 to 14.0 volts. However to float the battery up to 13.8 - 14.0 volts should be OK.

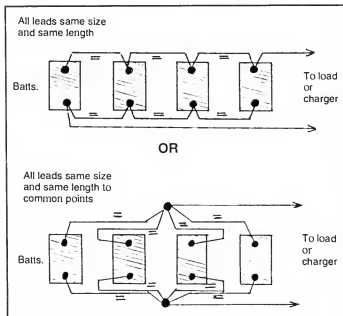
On removing a battery from charge it should, over a few hours, drop to about 12.5 volts and hold that voltage. To fall lower, say to 11.3 volts or less, indicates a battery of reduced capacity (or reduced life).

It can be seen that a rather heavy current can be called for to start a charge, say three batteries of 50 Amp/hr capacity each would ideally call for a total of 15 Amps, no less.

The in-built design of an ARLEC charger of 4 Amps output protects the unit against damage if placed across a battery of zero volts. In any case, the unit protects itself against damage if connected to a "flat" battery of say 8.0 volts. But even under this treatment, its output would be little more than 4 Amps. This charger will give about 4 Amps

at 11 volts down to about 2.15 Amps at 14 volts. Thus dividing 4 Amps between three batteries at start of charge would give each about one Amp, decreasing to less than 0.5 Amps (allowing some loss in connecting leads) with the batteries being in the sulphating zone (up to say 12.8 - 13.0 volts on charge) for too long each cycle.

However it must be admitted that a 4 Amp ARLEC charger would finally charge say three parallel batteries in good order up to float voltage of say 13.85 volts, but this



could be a few days — too long.

Incidentally ARLEC make a 6 Amp charger which is claimed to hold batteries to full charge, but I haven't tested this claim. (Some supermarkets, K-Mart etc. and Dick Smith part no. M9806). This model would be an improvement on the 4 Amp model, but still not the best for parallel charging, unless using batteries of say 25 - 30 Amp/hrs capacity.

The alternative would be to use a charger of say 20 Amp output across the parallel batteries until they reach say 14.5 volts, then switch to a smaller and regulated charger to float. Check the state of the batteries by taking Gravity readings to ensure they are reasonably the same and check the at-rest voltage after taking off charge for the same reason. Give individual batteries individual float charge as necessary.

There is no easy way — battery maintenance tends to be messy on traction duty (and it can be costly, done properly)

Stan Allison
Victoria

Sir,

Of help to David Mottram (Battery Chargers) may be the October 1998 edition of *Silicon Chip* magazine. Featured in there is a "connect and forget" battery charger which is voltage sensing and tops up on demand the battery under its care and then floats — a very simple circuit with few components. Should the problem be with battery life, a battery for car use is only deemed to have a deep cycle life of twenty five full charges and discharges. A Deep Cycle battery would be needed for this to be done on a regular basis and these are expensive. Consultation with a battery expert may be of help in this instance. Deep cycle batteries have thicker plates and a greater clearance in the bottom of the cell for sulphation to drop into so that it will not short out the plates, and are therefore capable of handling charging and discharging more frequently and heavier loads, hence the extra cost. Should cost be a deterrent, a look at some of the really heavy duty batteries for some of the diesel trucks may be an alternative. None will have the service life of the Deep Cycle battery, however.

Bruce Grice
Tasmania

Klug valve gear

Sir,

Not so long ago, I wrote an article on 'Klug' valve gear (AME issue No 76 p. 19) and feel that I owe the readers of AME an explanation.

I am currently writing a small book (50 pages or so) on the Hagans articulated 2-6-4-0T which ran on the North east Dundas Tramway on the West Coast of Tasmania and in so doing, have had to translate a huge amount of German into English. In the process I have discovered the following. *Klug* in German

means "clever, shrewd, intelligent, cunning or sensible"

Had I not been writing the book just mentioned, I would never have known!

Geoff Murdoch
Queensland

Mallets in Australia

Sir,

There has been a lot ado about Garratts in Australia and little ado about Mallets in Australia.

Why? Historically only three Mallets were ever used in Australia and consequently may have attracted little interest.

As they were all narrow gauge examples they might possibly be ideal prototypes for live steam modelling. I assume all three examples had compound propulsion mechanisms.

Below is a table of the three narrow gauge Mallets.

Thanks to Bruce Belbin of *Light Railways* LRRSA Vic., for providing, the above information and the above data.

See Murdoch G *Where's The Rest Of It?* *Australian Model Engineering* January-February 1998 Issue 76 pp 19-22 for reference to, and images of the preserved No 3.

The first ever Mallet was built by Tubize, Belgium in 1887 for the 1000mm C.F. Deauville, France. It was a four cylinder compound 0-4-4-0T.

The last ever Mallet was built by Nippon Sharyo, Japan, c/n 2007, in 1961 for the 750mm Atjiah Tramway, Indonesia. It is preserved as a four cylinder compound 0-4-4-2T.

For comparison, the first ever Garratt was built by Beyer Peacock, England, c/n 5292, in 1909 for the 24 inch North East Dundas Tramway, Tasmania. It was a four cylinder compound 0-4-0+0-4-0.

The last ever Garratt was built by Hunslet Taylor, South Africa, c/n 3901, in 1968 for the 24 inch South African Railways. It is a four cylinder simple 2-6-2+2-6-2.

James Tennant
Australian Capital Territory

Boiler leaks

Sir,

An old chestnut or not?

I hear the story when I am inspecting boilers, "Don't worry about the leaks, they will take up". Well, they don't. I would like some readers to answer my statement in the next issue, not giving me old wives tales, guesses or hear-say, but with factual statements.

Looking forward to your answers in the next issue and I will give my reasons in the issue following, why they don't "take up" but only appear to.

Jim Organ
New South Wales

Braised joints

Sir,

Thankyou for publishing my article re copper tube benders. My wife, Gwen, and I had quite a chuckle about the process of "braising" the silver solder joints. No doubt this process is akin to cooking the Sunday roast with an oxy torch. Flame grilled!

This confusion probably emanates from the fact that, in our house, it is not unusual for brazed parts to be dried between the pots on the hot kitchen stove after they have been recovered from the pickle bath. These parts do get thoroughly washed in water first!

This reminds me of once being at a barbecue, after a run with a rather notorious athletic club who chased a couple of blokes spreading paper all over the joint, where we cooked on the host's steel work bench and did the sausages in the attached vise, both sides at once!

Peter Lukey
Queensland

(*Observant readers will have noticed the 'braised' instead of 'brazed' in the drawings in Peter's article in issue 80 — our draftsman didn't! I missed it in the final proof, and I must say Peter did have it right in his originals. Anyone tried braising them? ... Ed.)*

<u>Railway</u>	<u>Builder</u>	<u>No.</u>	<u>Year</u>	<u>Wheel arr.</u>	<u>History</u>
Mt Magnet Tasmania	Orenstein & Koppel	882	1901	0-4-4-0T	No.1, 610mm used as spares for No.3 from 1930
Port Douglas Shire Tramway North Qld	Orenstein & Koppel	943	1902	0-4-4-0T	Douglas 750mm scrapped 1958
Mt Magnet Tasmania	Orenstein & Koppel	2609	1907	0-4-4-0T	No.3, 610mm. sold to Boulder Mine, Kalgoorlie, WA, 1946 Preserved 1962, being restored at Bennett Brook Railway, Perth

Club membership

Sir,

As one who has now been retired long enough to be just settling down and thinking about whether it really is possible to build that live steam model I've dreamt about for years, I have been really disturbed by some recent comment in AME about club membership. If the comments made (Editorial Sept-Oct) and in some correspondence are an accurate reflection of club attitude, it would be very tempting to say, "who needs 'em."

The truth of the matter is, however, that anybody who wants to make a boiler appears to need to be a member of a club with access to codes and boiler inspectors, etc.

Certainly a club cannot function without a lot of input from some of its members; and there will always be those who will contribute more than others; but to make it mandatory that all members attend working bees and open days, etc, with no or very few exceptions, is sailing very close to the anti-discrimination laws.

Under John Cummings comments in Sept-Oct issue is a standard piece by David Proctor inviting people to join a great hobby. I very much doubt that I would find a place in a club which strictly applies Mr Cumming standards.

Nor, I think, would a young person with perhaps all the other interests of school, sport and girls/boys (I hope I have the right order) be at all encouraged to develop skills, which if not kept alive in model engineering circles, appear to be dying out.

There are those of us who cannot possibly meet the standards asked for. There are those of physical disability, those whose religious belief prevent attendance on Sunday, those whose religion regards Saturday as sacred and those who perhaps live too far away and just cannot plain afford to attend as regularly as they would like.

Surely club membership has something to offer all these people (as well as access to a boiler inspector, etc). I hope that even with my own restriction of distance and religious belief that I will have something to offer a club, even though I cannot reach the standard of participation called for.

I was fortunate to be able to attend the Saturday of the Melbourne Society's recent exhibition and to speak to a couple of great people who seemed to think that their club had some sort of country membership and that this problem has been allowed for by way of a reduced membership fee. Personally I would be quite prepared to pay a higher fee than the workers, just so that I could belong and have access to the club's friendship, guidance, newsletter and testing and certification facilities when needed. When the club listing comes out in AME, I will certainly be checking on the more reachable clubs in Victoria to see if anybody wants me, even as an associate or some such.

I see that in his last paragraph John Cummings is encouraging people to get involved, and this is commendable, but I think it is sad that the earlier part of his article and some correspondence gives the impression that the less than perfect are not wanted. I hope I am reading these comments wrongly, but I fear not. Over to you guys!

R Graeme Burgin
Victoria

(As has been pointed out previously, you do not need to be a member of a club to build a boiler, certifiable to the Code, but you may find some clubs could be reluctant to let you run it on their facilities.)

I feel that in some respects Graeme has missed the point of what John Cummings said. John was pointing out some of the things to consider before you decide you want to join a club, particularly relating to the assets and

goodwill of the club achieved by much hard work over many years, and with regard to how the club can benefit from you being there. The differences in club requirements and rules and the enforcing of them are almost as numerous as the clubs themselves. At no stage was it suggested that those with disabilities, religious beliefs or any other of Graeme's examples be rejected or ostracised. In fact there are many people who fall into these groups who are members of clubs around the country with varying degrees of involvement. To the best of my knowledge, most clubs offer a 'country membership' at a reduced rate to cater for members who reside too far away to attend regularly.

I did say on the last occasion that I would not publish any further material related to this topic, but because of some of the different issues Graeme has raised, I have made an exception this time.

I am hoping to have the club listing in the next issue of AME...Have you sent in an update for your club? If not and it is wrongly listed...I will have a hearing loss! ...Ed.)

Letterbox Contributions

You are welcome to send letters by mail to: PO Box 21, Higgins, ACT, 2615 or fax to: (02) 6254 1641 or e-mail to: ame@dynamite.com.au

As far as possible, AME is an open forum for all members of our hobby. Therefore, all expressions of fact or opinion — as long as they are not libellous — will be considered for publication.

Please type or clearly print your letters, as script is often difficult to interpret. Due to popularity of Letter Box and limited space, letters of 400 words or less will have a better chance of being published.

News Desk



with David Proctor

Well, here we are in another year and there's only twelve months to go until we see how many computers really are Year 2000 compliant. As far as AME is concerned, we don't anticipate any problems as very little of our magazine software is date driven and we already have a plan in place to avoid any disruption to our accounts.

One of the big events towards the end of 1998 was the 4th Model Engineering Exhibi-

tion in Melbourne, which is reported on elsewhere in these pages. I would like to take this opportunity to publicly thank the organisers and all the model engineers I met in Melbourne for their wonderful hospitality and welcome. In spite of the cold showers, it was one of the best weekends I have had for a long time, and I can thoroughly recommend Victorian hospitality. I reckon the trams are pretty good too!

Track plans

Calling all club secretaries in Australia and New Zealand — do you have a plan of your club's track layout. If you do, we would be most grateful if you could send a copy to AME, please.

Correction

In the coverage of the Granchester opening in the last issue a Blowfly was referred to as being Barry Potter's. Ron Chiddy has informed me that he is alive and well and the loco is his, bought from Barry some years ago.

Addresses

It is amazing just how long it takes for some clubs and readers to realise that our address has changed. For the past year, AME's current address has appeared in every issue. We still receive a lot of mail addressed to the previous address at Bundanoon, and that is understandable, but we also still receive mail addressed to the even older address at Robert-

son and even the odd letter to the original Penrose address. A little attention to detail can save a lot of time.

Mailing problems

Another hiccup occurred with the people who place the magazine in envelopes for mailing. When the last issue was being mailed, some were sent out without address labels and were naturally, undeliverable. We apologise for any inconvenience. If you missed your magazine, please contact us.

Trade and commercial

AME Retail advise that they now have a new video in stock — *Steam & Diesel Railway Review*. It is from the same people as the *Milestones in Preservation* video reviewed in this issue and is available for \$44.95 posted. I have had a sneak preview of it and it is without doubt one of the best Australian video productions I have seen. Footage is Australia wide and something perhaps a bit unusual is some spectacular footage of steam on the Emu Bay Railway

Just received is the latest catalogue from Greg Edwards of **Data Sheets** (PO Box 2, Braddon ACT 2612). Recent additions to the range are Data Sheets for the NSWGR 59 class steamer and 47 class diesel. This excellent range of highly detailed drawings is well known to most hobbyists in Australia

Hobby Mechanics now have an e-mail address. You can contact them at: jstrach@power.com.au

On a lighter note

One day, a man was walking along the beach and came across an odd-looking bottle. Not being one to ignore tradition, he rubbed it and, much to his surprise, a Genie actually appeared.

"For releasing me from the bottle, I will grant you three wishes," said the Genie. The man was ecstatic. "But there's a catch," the Genie continued. "What catch?" asked the man, eyeing the Genie suspiciously.

The Genie replied, "For each of your wishes, every lawyer in the world will receive

double what you asked for." "I can live with that! No problem!" replied the elated man.

"What is your first wish?"

"Well, I've always wanted a Ferrari!"

POOF! A Ferrari appeared in front of the man. "Now, every lawyer in the world has been given two Ferraris," said the Genie. "What is your next wish?"

"I could really use a million dollars," replied the man, and **POOF!** One million dollars appeared at his feet.

"Now, every lawyer in the world is two million dollars richer," the Genie reminded the man. "Well, that's okay, as long as I've got my million," replied the man.

"And what is your final wish?"

The man thought long and hard, and finally said, "Well, you know, I've always wanted to donate a kidney...."

Apologies to any lawyers out there! Have a good holiday season, go safely and achieve lots!



Classifieds

Miniature railway for sale

- 7 1/4" gauge, over 1000 metres of track, locos, riding trucks, extra steel sleepers, 12ft turntable and 2 bridges. \$18,000 Strathalbyn. Phone Rod Muller (08) 8536 2489

7 1/4" steam tank loco for sale

- 0-4-2 medium large side-tank, good steamer, new boiler cert. Copy of industrial style loco. Would consider swap petrol/diesel loco similar value. Asking \$6800 (02) 6677 1094 after hours.

Die Filing MC for sale

- 240V with quartz fibre optic light & jewellers saw blade holder. \$700. Oh (02) 4950 5585

Wanted — Quorn tool & cutter grinder assembly kit

- QMK 2 preferred. I understand Hobby Mechanics of Kenmore in Qld have been supplying these kits. I require drawings and springs, ball journal bearings and two Ground hard chrome bars for the bed. It needs to be a recent acquisition due to modifications that have been made. Phone Ray Teicher (03) 5127 8916

5" early American style tender loco for sale

- 4-4-0, 2.285m length, Briggs boiler, cert. to June 2000. Separate mobile stands for engine & tender. A very attractive engine for \$10,000. Ph (07) 3353 1625

7 1/4" Highlander LMS Black Five for sale

- Professionally built with copper boiler, cert. to Dec 2000. A very good steamer for \$16,000. Ph (07) 3353 1625

Wanted to Buy magazines

- The following magazines wanted to complete a collection. *Model Engineering Workshop* Vols #2, 4, 5, 7, 8, 9, 13, 15 and 41. *World of Model Engineering* Vol #3. Will pay by issue plus postage or as desired. Please contact Russell Dunn (03) 6446 1488 (BH), (03) 6446 0012 (AH), or Fax (03) 6446 1474, or e-mail: russell@webnet.com.au

Wanted — 12" gauge steam loco

- Preferably in running order, anything considered. (02) 4952 4477 (night)

5" gauge track for sale

- Approx. 400", plus 2 t/outs, good cond. For details Ph. Barry (08) 8248 4843

Capstan lathe for sale

- Smart & Brown Series 35, 230-3000 rpm, collets, roller boxes etc. Bar fed, suds pump. \$600 offers. Brian (02) 9456 5240 Berowra

5" gauge 2-6-6-4 Mallet for sale

- Based on Norfolk & Western A class, one of the largest 5" gauge locos in Australia. Will haul in excess of 2 tons, has 8" copper boiler, feed pumps, sight-feed lubrication, many extras. \$24,000. Further details contact John (08) 8362 3269 Fax (08) 8362 3952

Subscribers Free Market

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Lathe chuck 3 inch Burnerd 4-jaw independant. \$100 ono. Les (02) 9821 1545

Bridgeport type milling machine, lots accessories. \$2700. Take good 7" - 10" shaper, power hacksaw in trade (03) 9752 4065 (evenings)

Model Engineer, 218 editions 1984-1991 complete. 1987 2 missing. 1993 Jan-July. Best offer. Ph. (03) 5595 1195

English Model Engineer Exhibition Handbooks (16) for sale. \$1.00 each. Phone (02) 6362 4774

Launch engine, 3" bore 3 7/8" stroke, 3-4hp. Call Mike (07) 4926 8160

Shaper, Omerid, 240 volt, 10 inch stroke, good order \$400 Ph. (03) 9758 3514

WANTED

Vertical slide to suit bench lathe EMCO Super Eight or good mill drill. Eric Ph. (07) 5524 3117

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- \$3.50 per line as published (including heading). Don't send payment with ad, we'll invoice you after publication. No limit to the number of words.

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- Non-commercial only, at the publisher's discretion.
- Maximum of twenty words, including your contact name, phone number or address.
- Posted, on special form provided. No faxes please.
- 5" gauge or larger locomotives (for sale) are not eligible.
- Only one entry per issue.



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Currently we are building a 24" gauge American 0-4-0 steam, loco, also three 10-3/4" diameter boilers for Italy, 7-1/2" and 15" gauge castings for USA as well as maintaining a 15" gauge railway in Brunei.



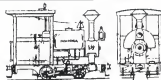
Do you want to build a particular narrow gauge loco? Inside or outside frames? A Garratt, Mallet or geared loco? A heavy duty eight-coupled or a simple, easy to build Suzie?

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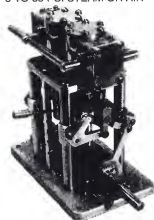
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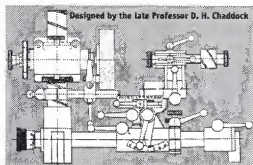


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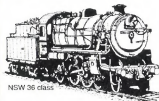
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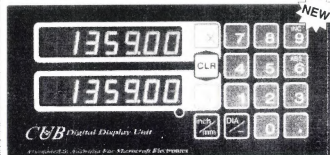


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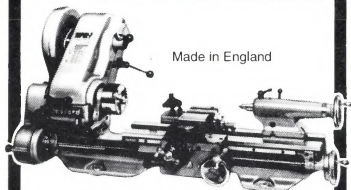
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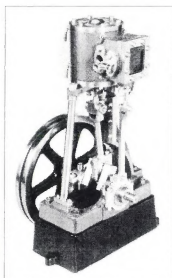
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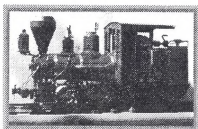


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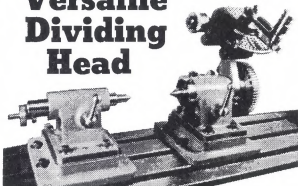
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